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by

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AN EXAMINATION OF THE PROVISION AND USE OF SPACE IN EUROPEAN HOUSING, INDOOR AND OUTDOOR, COMPARING NORTHERN AND SOUTHERN COUNTRIES.

A C K N O W L E D G E M E N T S

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FOREWORD

and

DEFINITION OF TERMS

The urge to write this thesis occurred while re-reading Miss Elizabeth Denby's Europe Rehoused after a lapse of years. That notable book appeared in 1938, at a time when a new generation of architects trained in such architectural schools as the A. A., The Department of Architecture at Liverpool and that at Edinburgh, with its newly formed and socially-orientated Department of Civic Design, were ready for new serious study of housing in its social and its civic significance. For the very short period left for travel in Europe which was getting ready for war, Europe Rehoused was a guide-book without which we of that generation might have taken much longer than in fact we did, to grasp the social and the civic significance of the housing we saw on our eleventh-hour Continental study tours of 1938 and 1939. In particular we needed to be confronted with, and brought to understand that curious dichotomy: the British origin of co-operatives, savings-societies, modern sanitation, garden cities, byelaws and public authority inspection, and the Continental development of all these things to a point where, by comparison, British achievement seemed to lag far behind. And before we tried to decide for ourselves whether to prefer among the housing colonies of Vienna and Stockholm, the low density housing at Aspern and Appelviken to the high density blocks of the Karl Marx Hof and of Gärdet, we needed some introduction to the problem of land use, to learn that land is a constant, some of it to be preserved for

agriculture and some too for the preservation of health. Again, it was important to be confronted with problems of finance, differently solved from one country to another, and to be made to realise that each dwelling and each block of dwellings is primarily value for the money spent on it. All these necessary confrontations Miss Denby brought about.

To the present writer the most important ingredient in Europe Rehoused was the author's own approach to the study of dwellings: what they were like to live in; how they were lived in; how the space and the equipment provided were used; the sense that in the judgment of all such questions contact with the ordinary people living in the dwellings was vital. Tenants thought of as such, living somehow behind Georgian elevations as they looked out across their unused front gardens, were now turned into clients with intricate domestic needs, which were seen to vary from one region to another even while they varied from person to person. The terms Georgian and Baroque, and all matters of style and architectural preference, from the angles of roofs to the textures of walls, were seen to play only a subordinate part in the success of an environment in which space-use in its functional sense became the deciding factor.

That space-use and space-provision are not necessarily the same thing did not immediately appear from Miss Denby's study. She was appraising something that worked, not something that had broken down. In these optimistic days pragmatic assumption that purposeful study would achieve its purpose had not yet been tempered with

existentialist doubts. Appraisal of success abroad was therefore seen as a first step towards adjusting the lagging achievement at home. 'Have the right vision and the right action will follow'[1] was the appropriate motto to bring back to Great Britain from the grand tour of the 1930's. Is it so to-day? This question the writer feels bound to investigate and embarks on the task with, it may be, the existential approach that he felt Rasmussen expressed when, in revising the pre-war edition of 'London' for the consumption of a post-war generation he warned 'Technology cannot solve the problem of cities'.[2] The criteria of success are different from what they were in 1938. They rest on no easy assumptions and one study-group of architects, more socially aware than those of thirty years ago, may condemn what another has found successful possibly only some months before.[3] It is no longer accepted that Vienna or Stockholm had the answers, nor for that matter that, until its dissolution, these were in the possession of the L. C. C., for there is now a grand tour of housing in the U.K. to form a new counterpart to Elizabeth Denby's. It extends to Scotland and in it new British achievements are measured with the others. In the measurement failure and success emerge by methods of assessment which architects are learning from sociologists. The pattern of living has to be revealed, the standard of living judged, the space standards to suit both these established, applied and then evaluated in their application. The pattern of living is changing fast, says the Parker Morris Report, and in material terms people are better off than ever before. It says this of the U.K. but the same could be said of much of Europe, North or South. What then, is the picture today when space provided is

compared with space used? It might reasonably be expected that in a period of rapid change, of rapid economic expansion, including that within the ordinary family with its new and larger pay-packets, space provision would have difficulty in reaching the standards needed for space use. The European tour to-day might be expected to reveal not so much a continent striving to provide minimum civilised standards of dwelling as one looking for ways of reaching maximum standards. That is in fact the situation the present writer has found to prevail, with variations from country to country.

This thesis is not, therefore, a confrontation with the success of some for the encouragement of others. It sets out without even the initial encouragement that by standards in mind to-day, things anywhere have gone particularly well. The early achievements of Vienna and Stockholm were discovered and emulated both in their high and low density versions, but in their emulations have been judged to leave something to be desired. They have their own built-in obsolescences as all architecture has had whether socially aware or not. The social significance of the great new housing developments of the U.K., of France, of Northern Germany, of Italy, recovering as these and other countries still are from the Second World War and from the wasted years before it, may be a marking of time where earlier on in the 20th century in Stockholm and Vienna, in Copenhagen and in Rotterdam, a forward movement more clearly took place. But whatever the relation now existing between architecture and social progress, the time

seemed to have come for serious appraisal of what has been built to live in during these decades of new change and new experience of life, of vast new building programmes launched in all the frenzy of keeping pace with a rapidly advancing technology. Re-reading Europe Rehoused in the light of such reflections gave the necessary impulse to action.

Miss Denby investigated six countries: two winners of the First World War, two neutrals and two losers. The political scene to-day is not one which reflects in the same degree belligerence or neutrality in the Second World War, nor is the dichotomy between Britain and the Continent politically or culturally as pronounced as it was then. Rather is it the case that Britain is becoming joined to the European continent in new ways, not as a conqueror in war, nor yet as a loser, not as a neutral, now or at any time, but as a group of small countries facing the same problems as the others. Their continued existence within a new European wholeness is becoming a characteristic of the new Europe, as the separately sovereign states are in some of the same ways characteristic of the U. S. A. While historical external relationships and internal traditions are still determinate in many matters in which such things have not been felt in America, the main factors which determine the environments of the European nations seem now to be more matters of geography. For long we have spoken of the northern and southern states of the U. S. A. The time may have come to speak more of the northern and southern countries of Europe. Such are relative terms, but they help to suggest a geographical selection which

is in some degree the counterpart of Miss Denby's political selection. Thus it is that though countries visited in the course of the present study are a long list, as was the case with hers, the presentation of this study in thesis form concentrates on a short list of five: two Northern, Scotland and Denmark; one Southern, Italy; and two, France and West Germany, which lie in such a way that they span a significant distance from north to south and possess within their boundaries some of the characteristics of both regions.

Similarly, the writer's concern is less with the mass of people who carry the national label of Scots, Danes, Italians, French and Germans, as it is with these people as individuals. The particular purpose of the study in each of the countries is to bring to light the relation existing between provision of space and use of space, taking account of traditional attitudes both on the part of the provider and the user, and pointing out the trends which these attitudes seem now to be following. Certain conclusions are reached and these point to certain kinds of action, by government, by professional bodies, by universities, by industry and by individuals which, if taken in the context of present trends could bring space provision and space use in all the countries studied into a new state of harmony.

The thesis is written with the minimum of professional and technical jargon, and there are few terms to define. Provision of space is used as a very general term. It means the design and construction of the house, whoever designs and constructs it. It carries the sense that the provider is not so much the person or

persons who designed, constructed or paid for the house as the whole society in whose context of living the house was designed, constructed and paid for. Thus it will be found that this thesis draws the minimum distinction between houses provided by public authorities or the like, and houses provided by people themselves, and the term 'housing' is nowhere taken to mean only public authority or state-aided housing.

Similarly the use of space is taken to mean what people do with their space however they have acquired the use of it, and whatever control they had over its provision.

In theory, this width of definition means that all types of dwelling built within each of the countries come within the range of study. In practice it seemed right to narrow the selection of examples to such kinds of dwelling as might be expected to show some tension between space-provision and space use. In other words, with some exceptions, houses for the well-to-do are not selected for case study, for in them it might be assumed that space provision and space use are removed from the state of ten sion and conflict which, in some degree, characterises all other housing. But that only means that, within the range of examples considered for selection, there has been some deliberate search for those which reduce this conflict to a minimum, within given standards of living. If these standards largely exclude conside ration of ways of living, of space provision and space use, extravagantly beyond the common

levels, then these common levels are nevertheless taken to include a fairly wide range. Middle class levels are not excluded, and in the context of embourgeoisement of the working classes, a process current in some of the countries and present in them all, particular attention is paid to the working family emerging from the struggling existence which the term working class acquired when it was synonymous with poverty and the space-provision of the slum, new slum or old. This emergence is never more clearly marked than when such a family finds itself, by whatever process, in a new and spacious house.

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CHAPTER ONE

GEOGRAPHICAL AND HISTORICAL BACKGROUND

Shelter has always been regarded as among the first essentials of human existence. Among primitive peoples surviving to-day there are few who do not construct some form of hut or tent where they may sleep in safety, protected from bad weather, enemies or marauding beasts. Archeology suggests that this was always so, with distinctions of race, time and circumstance resulting in distinct types of shelter. There were tree-houses which, found today, are not dwellings but lookout posts, stores or refuges. There were lake-dwellings and many varieties of dwelling built on the ground and wherever there were caves these have been used either in their natural state or adapted and decorated. Today there are cave-dwellers in America, Africa, China, Ceylon and Australia, while for other reasons many families still live in caves, however thoroughly adapted and domesticated, in France, Italy and other Mediterranean countries. Backward peoples such as African bushmen or Australian natives, while often cave-dwellers by preference, make shelters were no caves are available. The shelter, the provision of space, is simple, but its use has its own mild complexity. A bushman spending a night in the open, as Van der Post tells us,[1] will dig a hole in the sand and sleep there with his wife on a skin spread over it, their heads sheltered from the heavy dew by thick thorn branches planted at an

angle. He describes the evening scene thus:

> "The woman's wooden mortar and pestle stood nearby with her grubbing stick of iron-wood beside it. On some coals drawn to the side of the neat little fire strips of meat were laid to grill: with the subtle savour of wood smoke they spread a most provocative smell in the still air. Small and poorly appointed as her "place" was, it had been arranged to satisfy some inner need or order."

For family use a hut some three feet high is built of branches of thick thorn covered with grass, brushwood or mats of reeds. Again the ground is scooped out inside to increase the headroom, and the family supply of water in ostrich-shells set firmly upright in sand and piled crescent-wise against the hut wall. Similarly a party of Australian natives when camping for the night will set up a line of leafy boughs to act as a windscreen. If the weather is bad the boughs will be interlaced overhead to form a hut. If they are staying long in one place they make a regular framework of branches and thatch it with sheets of bark, leaves, grass, turf or layers of clay. Bushmen and Australian natives rarely advance beyond these primitive forms of shelter. Other primitive peoples have made their various advances, depending on climate, available materials, occupations, and standard of culture or taste and skill. Implication that certain societies become static as regards shelter may be relevant to questions of halted progress in modern housing in some of its manifestations. A point also to be made and applied to our society is that the urge to create shelter ab initio, as distinct from adapting what already exists, is present in mankind's most elementary consciousness. These two ways of creating shelter, adaptation of shelter that exists and construction of new shelter, are as distinct and as complementary to one another in modern advanced society as they have been or still are in primitive societies.

The relation between sheltered space created and the materials available to create it has likewise a continuing significance from primitive to advanced societies. In primitive societies this relation is direct and its main examples interesting and effective.

In Africa, South of the Sahara Desert, timber, grass reeds and leaves provide materials for house-building, each area having its special characteristics such as the hemispherical Zulu house, the peaked Ovampo, the asymetrical huts of Bechuana, and those built on piles in the Congo and Upper Nile. Some have roofs resting on the ground, some have high walls; some, such as the Negrillo, are only a few feet high; some such as the Baganda, are 50 or more feet in diameter; only occasionally are the walls of stone. They are commonly round or oval, but from the Congo to the Cameroons rectangular houses are built in rows facing each other in clearings in the forest. The nomads of the northern deserts live in black tents or awnings made of cloth, commonly goat's hair, propped up on poles. Similar black tents are found to the east, across Persia to Afghanistan and Baluchistan, and in Tibet.

Again, tents covered with skins, bark and brushwood are characteristic of the peoples of northern Asia, spreading into Europe with the tents of the Lapps, covered with skins and cloth, compared with which the felt tents of the Mongolian plains, threefold in winter, with the curtained opening facing south, are the height of luxury. The simplest Asian dwellings are those of the Andamanese consisting of a mat of palm leaves supported on poles. They are possibly the best simple example of the tropical house where shelter from sun and rain is all that matters. Wind and cold, still less snow and sleet, are not part of the climatic armament against human comfort. The opposite

extreme is the Eskimo house built of blocks of snow, though Sally Carrighar points out that these are winter dwellings built when snow is plentiful and that the characteristic igloo of the other seasons is a hut of whalebone and whatever other material is available including stone and timber.[2]

For all these dwellings, occupancy is by families but there is considerable incidence of the communal house, such as those built in America in former times by the Iroquois of poles and bark 50 to 100 feet long. The typical South Sea long house built on piles and stretching for hundreds of feet, every detail in its construction decreed by magic, is the outstanding survival to-day, as in New Guinea.

It is for reflection how far the customs and more particularly the byelaws and building regulations of advanced societies lie within the category of magic, a modern magic not redeemed by the presence of inherited artistic skills such as those which make South Sea houses so inherently beautiful... Again, it is for serious reflection whether Europeans, surrounded by continents in which a wealth of primitive architectural skill still exists, have led the world into advanced society with anything like the same sense of the appropriate, functionally or aesthetically. In particular it might be asked whether climate has been as healthily respected, its sunshine, rain, snow and wind.

A common feature of ancient and modern houses, of those in primitive and advanced societies, is the central place given to the domestic hearth. And the reluctance with which its use is dispensed with to-day as technology decrees other forms of heat is a feature of not a few interviews undertaken during the present study.

The use of fire is one of man's most ancient achievements. It is found among people in the most primitive states of culture, and remains of hearths found at the entrances to caves of the Old Stone Age show that in those prehistoric times it was used for warmth, for cooking and for protection against savage animals. In the lore of primitive peoples the secret of producing fire is generally held to have been disclosed by a supernatural being, much as Prometheus is said in Greek legend to have brought it to earth from the chariot of the sun, or from the nether regions. The sacred character of fire has survived all down the ages, with two themes: the one life-giving and renewing, the other purifying.

The domestic hearth has carried the first theme down to our own day, and the outstanding testimony to its renewing qualities has been the insistence shown by all classes of British society to retain it as the means of heating their main room despite its demonstrable inefficiency and against the claim of more rational means of supplying heat. In houses visited, replies to questions have varied between simple statements such as, "It feels better than central heating" to more specifically therapeutic statements such as, "I think it's healthier", or, in a negative form, "If I sit with radiators all evening, or on an electric floor, I feel drowsy and the next day I'm listless." Rational explanations offered have been based on the ventilation which such a fire operates, or on the fact that its heat is radiant, even violently so, and thus stimulating.

Such a noticeable physiological effect of sitting before a glowing or flaming fire may underlie the assumption of sacredness in times past, but the assumption has been at various times carried very far. The Vestal virgins, flamines, guardians of the sacred fire, are among the many such persons, divine kings, solar priests and temple watchers, who appear in the records of Western antiquity, their persons hedged round with taboos.

In the East the connection with divinity is more specific. Fire is conceived to be the earthly form of the heavenly light and centres in the sun as the source of all life. In the Indian Brahmana ritual the king in his divine capacity originally appears to have been equated with fire and the sun, so that he surpassed all beings in brightness. He was addressed as Deva, 'god', using the root div. to shine. Celestial fire was the symbol of Persian kings and of Mithra, god of light, later identified with sol invictus, the invincible sun, a title assumed by the Caesars in the Roman Empire when they became the supreme objects of worship. The title le Roi Soleil applied to Louis XIV of France, had this kind of significance, though without the same religious sentiment.[3]

The life-giving power of the sun and its earthly counterpart, fire, is defined in Indian religion, where its dispensing by the king and his deputies, the Brahmana, acquired an ethical significance when the course of the sun and the seasons were related to moral law. Varuna, god of the all-encompassing heavens, upheld both physical and moral orders so

that right was said to be fire and truth the sun, and in this way the Vedic God Agni, the all-creating fire and sacrificial flame, became the mediator between heaven and earth.[4]

Again, Zoroaster was born out of fire and it was the sacred duty of Zoroastrian priests to guard it, never letting the sun shine on it or a dead body defile it, and in this cult the regenerative vitality of fire and its cathartic action was further developed.

At the higher level of Greek philosophy, fire was considered to be one of the first principles of the universe, Heraclitus attributing all reality to it, making it the logos, which in the fourth Christian gospel is associated with light, with the Son of God, Light of the world. Light has its symbolic place in most Christian ceremonial, but the West retains calendric rituals resting on early pre-Christian beliefs. Bonfires kindled on All Hallows Eve have had as twin objectives giving new life to the dying sun and purifying away society's evil influences, just as the Beltane fires lit in Scotland in May are a welcome to the sun's reviving power, preceded on the eve of Mayday by raking out the hearths before the new fire is kindled.

Frowned on by orthodox Christianity, such rites still have much meaning to country people, and if the connection between all such things and the modern townsman's determination to keep his coal fire is only tenuous, his Yule log, with its ancestral associations and his mulled wine representing the libations once poured over it, establish his connection with the superstitious past.

Under the pressure of technological advance and social change,

not the least significant of which is the urge to establish smokeless zones, the coal fire seems now to be vanishing, even from the homes of the British. But the log fire survives, and is to be found in the traditional position of honour as the domestic hearth in many a house built for modern young people in a 20th century style of architecture. Excluded by the Bauhaus approach to design (discussed in Chapter 6), it was permitted by Corbusier in his one-off villas and in his Citrohan unit at Weissenhof. But its popularity today seems to derive from Scandinavia, and perhaps specifically from Finland, where Alvar Aalto incorporated a wood-burning hearth into his house Mairea built in the same year, 1927, as the Weissenhof exhibits. Apart from the house itself as an enclosure of walls and roof, this survival of the hearth is probably the main link between housing in today's advanced society and that of the primitive societies; just as its replacement by devices which create warmth without visible flame might be considered to be a phenomenon distinguishing advanced society from primitive, or at any rate marking an advance of reason over superstition.

Another such phenomenon is the provision of piped services, first of drainage and then of water supply. Significantly Roman engineering which was first to banish the visible fire from the house (unless it was actually on an altar) was the great innovator of water supply and the developer of drainage to matching importance. The twin achievement of engineering technique thus represented marks a central point in the history of the human dwelling. It also marks the central significance of the geographical accident which, from Rome onwards, made civilisation

develop in a continent where water is plentiful, where a piped supply to each house could eventually be taken for granted, and even where (as in modern Scandinavia) cities can supply in a similar way hot water as a public service. This is described in Chapter 5.

It may be an overstatement to speak of accidents. In any society, ancient or modern, primitive or advanced, shelter for the family develops not only in relation to available building materials and techniques but also to climate and social conditions, themselves greatly influenced by climate. Life in prehistoric times was chiefly spent in the open and the dwelling only provided shelter at night and during bad weather. This was a characteristic habit of man the hairless tropical animal, which he took with him in his northern migrations. But the effect of non-tropical climates forced him to develop more complicated shelter.

Therefore the structure and equipment of the house underwent from early times greater changes in northern regions than in southern. In one sense, of course, all Europe is a northern geographical area. And the generality is true of all European architecture, involving it inevitably rather than accidentally in leading advances. But within Europe the same northern and southern influences have had their effect. Extreme southern Europe is the backward area, extreme northern Europe (Sweden, Norway, Iceland) the progressive, with a progressive cockpit of activity in between, largely under northern influence, true, as we shall see in Chapter 4, even of Milan.

Ancient types of house have everywhere only survived in culturally

backward areas, and that mostly in a degenerate form. The bronze-age circular stone house of Mediterranean lands, akin to the African hut, still continues in the 'trullo' in Apulia as a peasant's dwelling, as a sheep-fold in south Grisons in Switzerland, and as food storage in the "cleitts" of St. Kilda off the west coast of Scotland. The bronze-age conifer-stem log house consisting of a single room with an open hearth survives as the herdsmen's hut in the remote valleys of Norway and the Alps, no longer normally inhabited by a whole family, but only during a few months by individual herdsmen. This is encountered in Chapter 4, in the grangia of Alpine Italy.

Neither history nor geography provide much definition of house-types, once the hut begins to give place to the house. Within the Fertile Crescent the villa centred on a hall or main living room seems to have been a close rival of the courtyard house and large establishments were combinations of the two.

Early recorded history seems, however, to emphasize the courtyard house as the ancient norm. Both Sumerian and Egyptian examples can be cited. Those in the former industrial village of Kahun in Egypt, were built about 2,500 B.C. for workmen and officials engaged in the construction of a neighbouring pyramid. The village was formally laid out on a rectangular plan with some 300 artisans' dwellings, larger houses for foremen, and mansions for the chief administrative officials. Each workman's dwelling consisted of a small courtyard from which three comparatively small rooms opened. Stairs led to a flat roof. The foremen's houses varied in size; some had only three rooms, others had as many as five rooms. The ten mansions contained

some 70 rooms each and were of uniform plan, on sites 138 by 198 ft. Each was divided into five sections: for the master, the public, men-servants, women-servants and women. The rooms were grouped round courtyards of which one was a colonnaded private court containing a water-tank and another a public court 63 ft. by 37 ft.

Conforming to the same type of dwelling are those of Mohenjo-Daro and Harappa in the Indus valley, of similar date to that of Kahun, but of Sumerian origin.

Houses built at Ur of the Chaldees in Abraham's time, about 2,000 B.C., were two storeys high and contained 13 to 14 rooms each, grouped round a central court. The external walls were blank, without windows, and were of burnt brick in their lower parts, mud-brick above. Brick stairs led to an upper floor. Terracotta drain-pipes have been found. These houses show some comfort if not luxury; but streets were crooked, narrow and probably dirty. Yet in the palace at Knossos on Crete remains of an elaborate system of drainage have been found, one branch taking the drainage from latrines, another dealing with the rain-water drainage from the streets. Clay models found in excavations seem to show that small houses near the palace were two storeys high with flat roofs.

The Greeks of the 5th to 4th centuries B.C. lavished their architectural skill upon temples and public buildings, but seem to have been content with comparatively modest private dwellings. All except the smallest cottages were usually two storeys high with the rooms grouped round a courtyard. External walls were blank except for the doorway, and streets, the widest measuring only 16 feet, were thus

open-air corridors for communication only. Floors were of earth, walls of unbaked brick and the roof of convex terracotta tiles. At Delos drainage arrangements have been found, with latrines.

Roman houses of the Republican period were very simple, usually with mud-brick walls and thatched or shingled roofs and were built round a courtyard like Greek and Egyptian examples. The houses of Pompeii are Italian rather than Greek but not typically Roman. Their remains exhibit a very high standard of comfort, luxury and refinement. The courtyard or atrium plan was still customary.

In later Rome, as in its busy maritime suburb of Ostia, urban conditions led to more concentrated planning and to the building of apartment-houses from three to five storeys high. The ground-floor was often occupied by arcaded shops or warehouses. The upper floors were approached directly from the street by separate staircases, thus constituting self-contained flats lit by balconied windows overlooking the street or gardens or yards in the rear. Roofs again were flat. Some such houses, built of brick, have survived at Ostia, mostly of the 3rd century A. D. In Roman Britain, houses in the larger towns were gabled and although detached, were separated only by narrow alleyways, but at Silchester the chess-board pattern of the little town allows about one acre of ground to each of its villas: a veritable garden city. The numerous Roman villas scattered over England were seldom occupied or built by Italians but were the homes of upper-class Britons following Roman fashions in such details as bath-rooms, central heating, mosaic floors and wall-paintings. The normal plan of these villas departs from the courtyard-house tradition and instead follows a type common

in Gaul, already adapted to northern conditions. It consists of rows of rooms ranged along a main corridor, often with the more important rooms at either end forming projecting wings, evidently in search of more light than the cloudy climate could shed into courtyards and rooms round them. If there is a courtyard, it is large and the wings extend round it. There are important examples of such villas at Chedworth, Folkestone and Brading.[5]

How much this departure from the courtyard norm of southern tradition had to do with contrasting northern habit is uncertain. Professor Tobias Faber describes how between 400 and 800 A.D. a characteristically contrasting northern house-type evolved which he calls the radelaenge. There were three rooms in a row; first the fire-house with its hearth, forming the dwelling itself, then a stable for cattle, then a barn. He deduces from archaeological data that it evolved from the dwelling-types of an earlier period. The pre-Roman einzelhöfe or isolated farms which in Roman Britain were developed into villas of the Gaulish pattern may have taken the radelaenge form and exercised a modifying influence on imported Mediterranean ideas, even those already northernised in Gaul.[6]

In itself the long low Viking house of the period 800 - 1,050 A.D., 100 feet in length with aisles down each side and extensive log fires down the centre, is a manifestation of the primitive communal long-house of any age and place, adapted for use in the cold and boisterous climates of the North. Made of timber, it was easy to build in forest-clad countries and the main development in mediaeval Northern Europe seems

in turn, to be a blend of this late iron-age form and that of the adapted Gaulish Roman villa. In spite of regional variations this is the trend followed in the North, in peasant communities at least. As an objective secondary to that of climatic adaptation it aimed at the isolation of a separate sleeping compartment from the common hall and the acquisition of a smokeless living room, an ambition interesting to draw into comparison across many centuries with that of the smokeless zone in modern town planning.

This ambition, a sign indicating technical and social advance, marks the emergence of the yeoman-peasant, first in Scandinavia, much later elsewhere, as the social partner of the feudal lord, whose house, on the other hand, the schloss or palace, always tended to follow the courtyard tradition, partly because of defence. Through its more glamourous examples the Schloss, in its central European form, is not without a certain distant influence, faintly traceable through Unwin and Baillie-Scott, on the current courtyard house revival of which more is to be said.

An archaic characteristic of the schloss type of building is the deliberate omission of corridors, one room being only accessible through another. This is still reflected in the middle-class home of Northern Central Europe and Scandinavia, side by side with evidence of a recognition, general in England, that each room should be separately accessible from a hall or passage. Whether the modern open-plan both in its Northern and Southern manifestations is a return to archaism of this kind may be arguable, especially if the reason for resorting to it is to save the space which would be used for communications

in a plan having separately enclosed rooms.

The isolation of smokeless living and sleeping compartments from the original single-room type with the open hearth can be traced most clearly in the development of the peasant's dwelling. Since such rooms must also be sealed above from the smoky attic, it was necessary to make a ceiling, thus preparing the way in one respect for the many-storeyed building in its late mediæval revival, dissociated as that was from ancient Roman experience with flats at places like Ostia. The men servants slept in a closet near the sheds or in the hay loft and for the old folk and the unmarried daughters bedrooms were often provided in free-standing store-houses which could be locked. Again, this kind of segregation continues into the storeyed if not the flatted town house of late mediæval and Georgian times.

An ancient type of radelaengen house has survived in the peasant's cottage of Bavaria and Saxony with related forms elsewhere which, even among the wealthy yeomanry, united family servants, herds and horses under the same roof and, at one time, in the same room. Out of it in course of time living and sleeping rooms were separated by partitioning as special compartments behind the hearth, a development similar to that of the 'withdrawing room' in England. An interesting example of such a house modernised in stages up to the present day, complete now with tiles and stainless steel sink, washing machine and other electric gear, is studied in Chapter 6.

Both in North and South the pedigree of the European dwelling house bifurcates only in the late middle ages into the separate developments of cottage and town house. The rise of the latter

undoubtedly began in Italy, with an adoption by patrician families in Florence, Venice and Siena of the palazzo. And its logical development is seen in the aristocratic town houses of this and other types of the following period. The middle-class version of the palazzo, partly as a result of the milder climate, remained more primitive in Italy than middle class houses in the North. This is one way in which a major quantity of Italian housing falls behind in the 19th century to become a slum problem of its own kind, and it leaves us to find the true development of the town house of this class in Northern countries.

This bifurcation is traced in Chapters 4, 5, and 8, with special reference in Chapter 7 to the French hôtel with its fascinating combination of urban and suburban character, though it is certainly a town house and in no sense a cottage.

In the 13th and 14th centuries towns north of the Alps consisted for the greater part of timber houses, and the country folk who had been attracted by privileges into the towns continued for a long time to follow their old occupations. Citizenship was linked with the possession of a house, but this was not an Italian palazzo. It was a much simpler building, and during the initial stages in the growth of the towns it could have differed but little from the peasant's dwelling. Even in Scotland, where stone was in use earlier than further south, it did not begin seriously to replace timber until about 1300.

Timber led to fires and mediæval municipalities (e. g. in many Swiss towns) often guaranteed a subsidy for every new stone building

and for the replacement of wood shingles or thatch, until then the normal coverings for roofs, by tiles or slates; while the erection of new timber buildings in the interior of towns was forbidden. In the 16th century in wealthier homes, glass began to replace parchment, pigskin, paper, linen and heavy shutters as a window-filling. This allowed the window space to be enlarged and encouraged also a certain modernisation of housekeeping in the peasant's dwelling in which operations could now be guided by eye more than by touch. But it was not until about 1700 that really transparent rectangular window panes were in general use.

The peasant's house did not develop its richly diversified regional types until the 16th century and even then only in Northern countries notably England, where there were free landowning farmers. Later the peasant's house loses distinction in the general spread of industrialization bequeathing a problem to be solved today in the design of houses for modern land settlement, triumphantly solved at S. Romualdo in Chapter 4, and in an interesting way at Hornberg in Chapter 6.

The characteristic shape of what are now considered 'old towns' first developed in the period about 1500 as a result of social, political, technical and architectural influences. The increase in population, the rise of trade and industry, purged the town of agricultural elements. The restricted area inside the walls meant that the houses had to be built in serried ranks and with many storeys. The division of inherited property led to the halving or quartering of the original street front, hence the cramped size of houses in many old quarters. On

the ground floor was usually placed the salesroom and the workshop of the craftsman or the stock-room of the merchant, opening to the street in a bay-window. It was closed by a shutter (in German Bretterladen, hence Laden, a shop) which by day could be raised to form a projecting 'awning' or lowered as a display counter. Another version of the awning, useful especially in northern countries, was the arcaded street of which notable examples are the Chester rows and the fragmentary remains of arcaded facades in Edinburgh. The living rooms proper both in northern and southern Europe were on the first floor. If, as in the prosperous middle classes, a dining room was included, it was usually placed on an upper storey, a position reversed in Georgian Britain when business was expelled from the ground floor whereupon the dining room took its place. The attic contained the atoreroom, for which reason a pulley was built into a gable opening or a dormer, and this picturesque arrangement is familiar to visitors to the older towns of central Europe and the Baltic.

A characteristic of the traditional dwelling house in the German-speaking lands, whether in town or country, is the tile stove heated from the kitchen or a corridor, which possesses considerable warmth-giving properties and does not emit smoke into the room, while, on the other hand, it fails to contribute to the freshness of the atmosphere. The seat nearest this contrivance, over the agreeably warmed smoke vent, was reserved for the grandfather. Isolated examples of such stoves date from the 14th century; from the 16th century they became more and more decorative, especially in Switzerland where Michel

de Montaigne admired them in graceful language in 1580, as did Dr. Alfred Nawrath in Austria, using photography to convey his impressions, in more recent times.

The development of individual rooms, in cottage, schloss, hôtel and every other kind of European dwelling was a complex process, if it is to be traced through each dwelling - type's own evolution. From the cottage to the hôtel, the span of development is at least 400 years. But the significant result was the specialised use of space with a new appreciation of privacy, especially affecting bedrooms.

Through these years or centuries the importance of the nuptial bed as the focal point of the primitive house next in importance to the hearth survived among the European ruling classes in the ritual of the state bed for which the architecture of the schloss provided the appropriate setting. As late as the 16th century the room with the four-post bed was the reception room even among the middle classes. It is only from that period that the modern conception of privacy developed and the bedroom became wholly separated from the living rooms proper, usually by its removal to the upper storey.

In the Condition of Man Lewis Mumford has much to say about the history of the bedroom from the late middle ages. It is, he says "a room devoted exclusively to love-making and sleep". He goes on to attribute its development to the rise of the middle classes, able to share the growing self-indulgence of the nobility, if not following it into the Rabelaisian Abbey of Thelema. Whatever inhibitions may have persisted among the members of this class from earlier centuries, with their "pallid undernourished men and women who appear so frequently

in paintings and tapestries" the period of the Renaissance and also of the Reformation saw a sexual emancipation take place on an all-Europe scale.[7] In the north it was modified by Puritanism a century or so later, and this is still a factor in house design for those northern countries in which puritanic influence has been strong. There the bedroom is a place for sleeping. Its other purpose is unmentionable or at any rate not to be given an expressive architectural setting. This distinction is traced in some detail in Chapters 4 and 5 and its significance noticed too in Chapters 6, 7 and 8. The case studies of modern houses include examples of the nuptial bed given pride of place (and representing the major furniture investment) proudly shown off by owner and wife as in bygone times. They are mainly from southern Europe and reflect certain uninhibited attitudes besides adherence to Roman Catholic teaching about marital life. Before this sexual emancipation, society had moved in another direction. In the self-governing towns of Germany, the Netherlands and Switzerland, closely imitated in the trading towns of Scandinavia and Britain, there developed in the 15th century a predominantly male society which gathered together in assembly rooms on festive and political occasions. Hence the extraordinarily splendid guild halls with their ornate interiors , carved wainscotting, stucco-work and brightly tiled stove (as found on the Continent) or extravagant chimney-piece (as found in England). In the self-governing towns themselves, envoys of the kings of France and England complained in their reports of the fatigue and expense of such banquets, to which they were constantly

forced to invite the local dignitaries. An accompaniment was that throughout Europe the custom was for women to be confined to the domestic sphere until, about 1700, in conformity with French example, they began to play a more prominent role and it became fashionable to receive visits in the private house. The social and literary education of women, which now became indispensable, led also to greater differentiation and elegance in the arrangement of the house. Everywhere the style of living approached as closely as possible to the model of the French court. In higher circles the type of the maison entre cour et jardin was imitated, to which a warehouse or a factory was frequently added in the wings. On the ground floor of the main building normally lay a spacious hall for the servants and a room opening on the garden. The reception rooms lay on the first floor (piano nobile, bel étage), the bedrooms in the attic. Normally such houses were not only inhabited by a married couple with their children, but by a whole family with a numerous staff of servants. In addition there were as a rule offices, workshops and warehouses in the same house or in outhouses, hence the often enormous proportions of the old family house, wherever there was room for it, as there usually was if its owners were content with a site away from the town centre.

In a way this whole trend is a further revival of the villa, which made its first renewed appearance as a Roman house-type in the Renaissance, but made little impact on the living accommodation of ordinary people. From Vignola's villa built at Rome for the pleasure-

loving Pope Julius III (Giovanni Maria del Monte) in 1550, this kind of dwelling is associated with the rich and luxurious, more so than the palazzo, which had its rich and poor versions. But in the 18th century it begins to coalesce with the hunting-lodge and, in a climate of opinion favourable to the romantic concept of architecture related to landscape, the villa acquires a more rough-and-ready form in which it begins to appeal to the middle classes besides the aristocracy. Soon it is found on the outskirts of towns, accessible from them by carriage road and furnished with carriage entrance and a garden front as though designed in direct succession from the great Renaissance designs of Vignola or Palladio. In the 19th century it becomes the refuge from deteriorating urban conditions for all who can afford it, however simplified its form and appointments. In the 20th it becomes on the one hand the rich business-man's house, in Surrey, in Helensburgh, on the hills above Florence or in the woods north of Copenhagen. On the other it acquires a new and cheaper existence as the bungalow lining the motor road out of town to which it clings in a parasitical embrace of drive, sewers, water supply, gas pipe and electricity cable. It lines the main roads out of Paris (not called there "villa" but pavillon) as it does the corresponding roads leading from Edinburgh and Hamburg. It has, of course, its excellent early examples, like those of C. F. Hansen at Altona in his classical manner in the 1820's, and in mid-20th century it renews its more acceptable form in architect-designed estate developments of which this thesis examines certain examples. They represent

a high level of social and architectural achievement, one of the latest words spoken about the human dwelling.

Equipment of the family dwelling of modern times, now a matter of complexity, consists of a series of innovations which can be traced to a general origin in the late mediaeval household, but more particularly to the interest in family life generated by the theology of the Reformation of the 16th century in the Northern countries.

Among the most important technical innovations of the 16th century was the change from cooking over or before the open fire to the cooking processes of the closed kitchen range. This entailed a radical change in kitchen utensils. The normal equipment of the open fire was iron or bronze vessels, placed on tripods or suspended on chains; but with the closed range these were replaced by copper pans, which, constantly polished, formed at once the decoration of the kitchen and the pride of the housewife, remaining today a persistent survival even in avant-garde utilitarian architecture. The completely closed chimney in the kitchen did not become common in any European country until the beginning of the 19th century, and it is well to remember when criticising Voysey or Mackintosh, Baillie Scott or Lutyens for their interpretation of the chimney corner, that this was less a mediaevalism than a last flowering of something still in surviving use.

In the 19th century the reduced size of the family, separation of workrooms and living rooms, increasing shortage of servants, and

an overall lack of dwelling space in the large towns exacted a reduction in the size of the house together with an increase of technical equipment, which spread particularly from England. The early Victorian water-closet was introduced on the Continent as late as 1860. In contrast to England, though not Scotland, the multi-storeyed apartment house had long played a much greater role on the whole of the Continent, North & South; in Paris as early as the 18th century and in Scotland at least as early as that. A significantly fresh approach to house design came late in the 19th century with the appearance of small English and Scottish country houses and suburban dwellings built for modern living in comfort by a new generation of architects. They were soon the admiration of all Europe, alerted to functional ideas in general by the oft-quoted German concept of Sachlichkeit, watchword of the later industrial revolution on the continent. C. F. A. Voysey was perhaps mainly instrumental in producing the simple and unpretentious style of domestic building which answered so readily to the application of this concept. Yet in England the 19th century successor to the middle-class Georgian town house, narrow, inconvenient and rather dark, hardly changed its plan from 1830 till 1919 when it began to be replaced in urban areas by flats. This tendency was even more pronounced after World War II, as the average town house proved unworkable in the absence of domestic help and was therefore converted to commercial uses or for government offices. For the same reason, coupled with the incidence of death duty in all the countries, the larger country

houses which formed so notable and attractive a feature particularly of English and Scottish life in the age before the industrial revolution, were being transformed into residential hotels or institutions. In England and Scotland they could be reprieved by their owners coming to agreements with Treasury and handing over to the National Trusts for these two countries, or else kept going for the time being on grants made by the Historic Buildings Councils.

Sanitation and electricity have meanwhile everywhere revolutionized house-design; and a revolt (partly due to the need for saving labour) from the 19th century habit of indiscriminate and unfunctional furnishing with profuse decoration, has resulted in generally simpler planning and design, based on functional requirements. To the middle-class clientèle of Voysey and Mackintosh, and the Continental equivalents of both, was added the increasingly powerful industrial working class whose 19th century struggles for economic and social justice reached fruition from about 1909 onwards as the provision of housing for them, first in Northern, then in Southern Europe, came under special and urgent review.

Up to the industrial revolution the total population in most countries had been relatively low and mostly lived in small towns and villages. Except in the few larger towns, workers lived in houses provided as part of the normal development of the landed estates or by employers housing their employees. Although many families were badly housed, the problem was not obvious, though as early as

Elizabethan times in England the queen issued a proclamation on the subject of London housing and emphasized the effect of bad housing on infectious disease. In England and close on her heels, Scotland, between 1760 and 1850, the Industrial Revolution caused a rapid change. The total population multiplied, the largest increase being in the existing larger towns and the new industrial towns and coal mining areas. Whereas in the rural areas the owners of the big estates continued to regard the provision of cottages as a necessary means of making their farms profitable, in the towns the situation was different. Cheap houses were required in large numbers for the industrial workers and this period witnessed the consequent rise of the speculative builder. The rapid development of large-scale industries owing to the introduction of various inventions, free trade in raw materials, foreign food supply and freedom from continental wars, created boom conditions. As a nation the United Kingdom entered a period of growth and change unparalleled in modern history. Germany followed closely on her heels. Yet the new urban areas grew up largely without governing principles of town development and in an absence of responsibility for good administration. Wages were low and few industrial workers could afford to buy a house or to pay more than a very small rent. The builder cut the coat according to the cloth. He had to build a house he could sell to an investor, who in turn would obtain a rent showing a return on his investment. The builder, therefore, reduced costs to a minimum by crowding as many dwellings as possible on to the land, by reducing the size of the building, and

by providing no sanitary conveniences or water supply. As a result, dwellings were constructed which were slums from the time they were occupied. During this period there was practically no government control, central or local, and a builder could do what he pleased. Control of buildings by the local authority with a view to proper construction, sufficiency of air space, though the subject of repeated agitation, was first obtained in Britain by the Public Health Act of 1875, Section 157, which enabled English and Welsh urban authorities to make bye-laws in respect of such matters. This they proceeded to do and the consequent "bye-law" housing, familiarly part of the English urban scene, shows at once the extent of the opportunity and the limitations of the mentality of those to whom it came. Scottish legislation came only a little later, under the Burgh Police Acts. Everything from street widths to ceiling heights was dimensioned with air volumes and clean air currents in mind, the prevention of nuisance, adequately ducted sanitation, and a clean water supply. A set of environmental conditions was created in which the horrible incidence of ill-health experienced hitherto in cities would, it was hoped, be prevented. In the countries studied, this was the period of the mietskasernen in Germany, and the tenements of Scotland.

This was also the period throughout Europe and beyond it when the miasmatic theory of the causation of disease was generally accepted. The basic document in English applying this theory to housing is Sir Edwin Chadwick's well known report, "The Sanitary Conditions of

the Labouring Classes", written in 1842 in conjunction with Dr. Southwood Smith. Of similar content is a report of the Copenhagen Public Health Commission written in 1851, of which the following were the main recommendations:[8]

1. To disperse the population.
2. To prevent diminution of the poor standards of space and air remaining in the city, and to increase them.
3. To promote cleanliness and other sanitary improvements.

Of such provisions modern public health practice rates clean water supply the most effective in the prevention of infectious disease, and points to later developments of the same method in the production of clean and safe milk, particularly in the control of tuberculosis. But this judgment is made in the light of knowledge of bacteriology, a science then in its infancy. And today recent exploratory knowledge of the psychological causes of much disease, not yet given embodiment in the law of housing though beginning to be applied in modern housing practice, promises to put bacteriology itself into a new perspective.

In any event, space standards laid down under public health legislation, which in most European countries came towards the end of the 19th century, have aimed principally at improved ventilation inside the dwelling, in accesses to the dwelling, and in the streets around it. But legislation and bye-law standards were one thing; their implementation was another. In Britain after the passing of the 1875 Act many years were to elapse before most local councils made full use of their powers and enforced them. And there were

cases of half-hearted enforcement, where in fact new slums were created, if less obnoxious than those of the earlier period. Moreover, where legislation was administered well, its effect was to increase the cost of building. Poorer families could not afford the rents which had to be charged for the new types of house. They remained in their slums or, as the middle classes moved out from the centres of towns to their own new suburbs where savings from salaries and profits from businesses were being invested in bespoken villas, two or more labouring families moved into each vacated city dwelling, creating new slums.

Similar situations developed as each European country entered the vortex of industrial development. Sout hern countries generally escaped the vast "architectural slums" of bye-law and other regulated housing characteristic of the north, through limitation, in the first place, of the growth of southern cities.

New architectural slums and old slums surviving from before public health legislation came under joint attack from thos e able to see the social evils in them. The report of a Royal Commission on Housing in 1885 did much in Britain to rouse public opinion about poor progress by portraying the evils and making recommendations. This led to the passing of the Housing of the Working Classes Act 1890, the first serious attempt to deal constructively and comprehensively with the problem. It gave wi de powers to Borough Councils, urban and rural district councils, and in London to the L. C. C., to

secure the closing and demolition of individual slum dwellings; to acquire slum areas; to clear and redevelop them with satisfactory homes, and to build new houses to meet the shortage of accommodation for the working classes. This act amended several times before 1914, produced relatively small results, but use was made of powers to close individual slum dwellings, a procedure which involved no charge upon the rates. Few councils, however, acquired and cleared slum areas or built houses to meet the shortage, because to do so involved a loss and therefore a burden on the rates. Before 1914 there was little financial assistance anywhere from central government; even in Britain housing acts were permissive only, imposing no duty on the local authorities to use their powers. The same occurred in France, and Denmark had to rely on the initiative of the newly established cooperatives.

In rural areas the fact that agriculture became less profitable (particularly after 1880) led to the big estate owners for the most part ceasing to build new cottages. This affected all the countries studied. In Scotland, in the lowlands, where the agricultural revolution of previous centuries had proceeded more slowly than in England, decline was perceptibly slow, but seeds were laid for a shortage of habitable houses in rural areas later, with the revival of agriculture during the period of the two world wars, to become acute. The British nation, including Scotland, entered the first world war badly housed both in town and country.

Undoubtedly a factor in the situation was a national ethos of strong individualism. The ideal 19th century Briton was the man who could make his way. Even Charles Dickens, whose writings did much to arouse interest in the fate of the poor, especially the London poor, portrays this character with relish. Wemmick, the lawyer's clerk in Great Expectations is the best drawn of several such. Each day as the office closes, he sets out on foot for Walworth, then a piece of what we would now call Green Belt, and half an hour later reaches his house there. It is obviously only a wooden hut of small dimensions, but made to look like a castle. It even has a drawbridge which Wemmick solemnly pulls up after him, and a small cannon. Inside it Pip, his young guest, enjoys a good meal with fresh country food and is introduced to the aged parent, a stone deaf old man proud of his successful son. In this picture we see the whole range of what the town-dwelling Briton was supposed to do about his own housing situation, and that of his dependent old people.[9] What Dickens does not explain is what would happen to Walworth and other rural places like it round the great city if everyone in London and the other great cities did as Wemmick did. His castle was only possible if a majority of Londoners stayed in the city slums. Sanitation is unmentioned but we may assume the use of well-prepared humus to grow the vegetables Pip is proudly shown. Here, besides a picturesque representation of individualism we have its main problem: put into modern terms, every one cannot

live at so low a density that conditions can remain insanitary without danger. Some must live at the higher density of the city itself, where only the highest standards of accommodation and of sanitation can be allowed to prevail.

The First World War had a profound effect both upon the housing problem and on public opinion regarding it. In the belligerent countries, the shortage was greatly aggravated by the circumstances that no houses had been built during the war itself. Existing slums became worse because repairs could not be carried out. Not only was the need for houses greater, but the difficulty of meeting it was much increased. The cost of building was trebled and the rate of interest doubled. The combined effect was to extend widely the number of families for whom ordinary commercial enterprise could not cater. Nevertheless Britain with other countries was determined that the problem should be resolutely tackled.

The Housing Act passed by the Great Britain parliament of 1919 introduced two principles new to housing anywhere. It imposed a duty on local authorities to provide for the housing needs of their district in so far as this was not provided for by other means. In return the Act provided substantial financial state subsidies to local authorities carrying out their work, conditionally on some of the burden being borne locally. Parliament thus recognised that the provision of houses and the clearances of slums could not be regarded solely as a business, but must be treated also as a service for which the public had responsibility both nationally and locally.

In the same period and for similar reasons Scandinavia took decisive steps towards co-operatives, later reaching achievements with this British method which its mother country is only now beginning to emulate. So did Italy, and in a less convinced way, France. Germany set up her own system, described in Chapter 6. Britain was the only country of the five to place the duty of providing housing fairly and squarely on government, but although the 1919 Act and subsequent amending acts envisaged the local authorities as the primary agency for building houses with subsidy they did make a limited provision for subsidising houses built by private enterprise subject to certain conditions. This was the main use made of the Chamberlain Act of 1923. The Wheatley Act of 1924 was specially designed to encourage by means of higher subsidies to the local authorities the provision of houses for letting at rents within the means of working class tenants. These two Acts operated side by side for the next few years. From 1928, however, the conditions were made more stringent and the subsidy to private enterprise was limited in practice to semi-philanthropic housing associations willing to let houses at rents which, even after the subsidy, provided a small return on the capital invested. But from that year onwards the lower cost of building led to an increasing output of small houses by speculative builders without any subsidy. Theirs was the victory, but for the public a defeat as standards of design and planning went down to new low levels and the dissolution

of hitherto promising ideals of layout destroyed the work of planning pioneers. Lewis Mumford, who sees this period as the scene of Patrick Geddes' operations - the "alternative to dissolution"- views these other operations as symptoms of "the essential sickness of the modern world, with its defective understanding of the personality and its needs."[10] Philanthropy gives way to the "New Barbarism" of commercial exploitation of the human environment.

Mumford's words fit the England and the Scotland of the 1920's and 1930's, but he is writing of mankind. And though he deplores the unimaginative and the impersonal in the modern British suburb, he also deplores the greater and more devastating influences not in evidence in Britain but pervading central and southern Europe: those of the state which has ceased altogether to think and act philanthropically, even commercially, and has surrendered to political fascism.

In this thesis the impact of fascism on housing is seen, first in Italy, the country of its origin, then in Germany. In both, this impact is followed by renewed impacts of democracy which seem to result in a certain precarious balance of fluctuations taking place between the philanthropic or humanitarian influence present in all the countries since mid-19th century, and the influence of commercialism. In Denmark, as in Scotland, democracy, uninterrupted in its progress by fascism, proceeds by attempting to hold the same balance, in the one by placing housing in the hands of the co-operative movement and in the other controlling it by

direct governmental participation, both in finance and in construction. Neither process banishes barbarism nor does it establish the humanitarian principle in the form of a human right to be adequately housed. Such establishment in principle arrives with the Habeas Domus legislation of France after World War II, where the impact is that of a renewed democracy entering upon an agglomeration of governmental ruins unique in the experience of any of the countries. This places France in a special category. It might be described as a housing cock-pit. In it modern government faces in a variety of forms its most continuously successful opposition to success in providing its citizens with the housing they seem both to claim as a right and to deserve as a reward for their own assertions of all human rights. Enormous efforts made in the period following habeas domus in France have not yet seen the end of the fight between the spurred opponents, the champions of laissez-faire as in its own way a French right to a way of life and the champions of new assertions of human rights.

It is not the business of this thesis to trace in detail in the various countries all the governmental steps, legislative and administrative, to provide housing space, but it becomes necessary to an understanding of space provision in modern housing to notice from time to time and from country to country how governmental attitudes and actions affect the situation. No longer is the type and the design of a house a matter only of broad trends related to

slow evolutions of types of society, nor a matter of empirical incorporation of technical improvements. It has all become a matter of acute social concern and of common action, whether spurred on or resisted, with trends set deliberately and technical improvement sought as a matter of trend-setting. If shelter is still a first essential of human existence it is this in a complex human situation and is being created both by a complex technology and in response to a developing complexity of space requirements and conditions. The primitive urges remain, but action lies elsewhere than in the hands of the man who chooses his hole in the ground and lays branches above it while his wife cooks a hunter's meal of slain bird or animal. The hole is, in some degree, government provided, the branches are as specified in regulations, and the meal has been bought in a super-market.

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CHAPTER TWO

ACTION BY GOVERNMENT

Housing and Town Planning Legislation;
Building Regulations;
Census-Taking;
The Setting of Standards.

Governmental regulation of housing has existed in some form about as long as civilization, but at the same time it is evident that the urban shape, with all its characteristics, is a reflection of existing social life, however regulated or unregulated. As habits and circumstances change, so does the physical pattern of environment, and as this environment emerges from change it is, in turn, fixed in its changed form by regulation. This complex cyclic movement is like a weaving process, producing as from a loom the fabric of the human community. If governmental regulation is one of the two parts of the weave, social change is the other. But since social change involves changing something that is already there just as much as it involves creating something new, regulation has to cover that range of things too. It has to deal with maintenance, improvement, reconstruction, then finally with condemnation, demolition and replacement. In the process, it has to see that planning at its various levels, national, regional and urban, is operating, so that land use happens in its correct arrangement and so that housing occurs within a settlement pattern.

Today, when in northern Europe we think of settlement patterns, it is in terms of a country as a whole, whether urban or rural, but this nation-wide scope is not necessarily valid elsewhere, in countries whose social and political development has been different from our own. It was not valid in Britain in the nineteenth century, when any restraint by Authority on free enterprise was considered an unwarrantable hindrance to national prosperity and in much of southern Europe it

is not valid today. Italy, the southern example chosen for this thesis, is on the verge, perhaps, of accepting its validity, for regional plans are beginning to operate there, both as regards development in northern prosperous Italy and the depressed south. Of this process more is said in Chapter 4. Indeed, the way planning is becoming recognised in modern Italy is reminiscent of its process of recognition in industrial Britain from 1890, or so, onwards. The scope of control over development at that time was strictly limited, and as this freedom coincided with a period of great physical expansion, when then occurred without control, public opinion became aware, to an effective extent, that some form of control over the use of land resources had become inevitable. This is the picture we get in much of Southern Europe today, notably along the Italian coast from the Isle of Elba to the French frontier, where a concept of planning is being forced into existence by circumstances, those of inevitable urban congestion.

The absence of any policy for land control in 19th century Britain led to extreme congestion in certain areas which initially held certain advantages for industrial purposes, and the great 'conurbations', as Patrick Geddes called these agglomerations of urban centres, came into existence, round London, in the Midlands, in Lancashire and on Clydeside. We have to do with Clydeside in this thesis. Today their counterparts are, surely, the regions from Genoa to Livorno, or from Toulon to Marseilles, as were the North Sea coastal regions of Hamburg, Bremen, Rotterdam and Amsterdam, with the Ruhr, only a few decades ago.

In the towns, houses and factories sprang up where land was convenient and cheap; roads and railways and the public services - drains and water supply - followed as they could, often quite inadequately. In the country, the most highly cultivated land was used for market gardens, frequently on the edges of the urban centres. Under a spreading rash of building, they tended to disappear and be recreated farther out. In addition, the pull of employment in the cities gradually drew into its vortex first the agriculturally marginal areas, and subsequently even the hitherto prosperous farming land, emptying them of their working population.

In 1909 the first Act of Parliament dealing specifically with Town Planning came into the Statute Book of Great Britain. This Act coupled town planning with housing, and it enabled local authorities to prepare schemes "for land in the course of development or likely to be used for building purposes".

In fact this piece of legislation was chiefly concerned with improvement in the sanitary conditions of housing, but is important in a wider context because it recognised, officially, for the first time, that the development and use of land for any given purpose should have some degree of regard to the wider public interest. Since that date, the scope of housing in this country and others has steadily increased, and today there is in each of the countries we are considering a formidable list of regulations and memoranda in existence, dealing with what may or may not be done within any given part of a town, whether this be a commercial, an industrial

or a housing area. Basic to all of these is the underlying idea that land should be used in the best interests of the whole nation, and this continues to become the basic reason for the creation, not of yet more housing authorities, but of a series of planning authorities with considerable powers of control over all development, including housing. These powers have both been enlarged and modified at various times in most of the northern countries, and as the nature of the problems involved and the practical possibilities of their solution have been progressively realised, southern Europe is following the lead given.

To some people, the whole elaborate fabric of the town planning authority appears both unnecessary and useless; and this reaction is understandable, as rapid changes in the improvement in the use of land are difficult to bring about. A half century of chaotic expansion, even if recognised to have been chaotic, will leave its mark for a very long time, and established uses, although recognised as unsuitable and detrimental, are not only hard to dislodge, but also sometimes prohibitively expensive. It is in this context of doubt about the expense of renewal both of residential and other areas, that we find that the chief characteristic of our existing towns is a wide variety of age groups of buildings particularly of residential buildings. We talk of the New Town of Edinburgh, - that part of the city north of Princes Street, and of the Old Town, - meaning the mediaeval city clustering along the Royal Mile between the castle and the palace, and there is a broad

historical distinction between these two sections of the city. But taking the buildings individually, they represent many different periods, cheek by jowl; many of these have been reconstructed from time to time. Similarly one can cite the Frederikstad area of Copenhagen and the formally planned parts of many French, Italian and German cities varying as they may as regards architectural quality from the excellence of, say, Nancy, to the mediocrity of Turin. Continual patching has the effect of prolonging the life of buildings, sometimes well beyond the real limit of their useful life. Juxtaposition of old and new, and the constant sinking of capital in rejuvenating obsolescent buildings reduces the possibility of effecting large-scale clearances, and so of replanning sizeable areas, and the infrequent opportunity thus given to bring about more or less dramatic urban transformations may also leave the impression that town planning, as a function of civic administration, has little real practical effect, besides perpetuating housing conditions which are ripe for improvement.

It is useful to remember, however, that the completely 'static' human community, is never found in reality. If the city is static, it is, like a human being, a corpse; Pompeii was effectively stabilised at a particular period in history, and has not changed since: to visit it is to see another world, so little resemblance is there to others of the same age which succeeding centuries have altered.

Any community still alive is in a state of perpetual flux and change. Estimates have been made that our major European cities are rebuilt over about a quarter of their total area every 25 years, quite apart from major catastrophes such as bomb damage. This replacement is accounted for mainly by physical obsolescence, but also by changes in social habits and ideas, improvements in manufacturing processes, and new requirements. For instance, the effect of the development in transport on the progressive redevelopment of cities is possibly one of the most significant factors persisting over a long period. Cities and towns are changing their appearance all the time, and it is this continuous modification that even in congested industrial regions makes large scale re-housing possible at a practical level, in spite of many formidable difficulties. In this thesis Hutchesontown - Gorbals is the prime example.

As the scope of town planning widens beyond the individual community such as the village, town or city into a policy for a region or the country as a whole, the visible results tend to become less easily apparent. Movements of population, changes in the use of land, afforestation, the reclamation of agriculturally poor land, the development of water power, all these changes tend to be slow, and hence are hardly spectacular. Housing as a function of government has a more ready appeal and the promise of quick results is often a political platform plank. Yet in spite of the temptation to rest all political hopes of improved environment on

housing legislation, its conspicuous lack of environmental success in 19th century Europe produced results of such an alarming nature that in the last 80 years it can be claimed that housing failure was the force that aroused a public conscience which has led to planning becoming a permanent function of Government, both at central and local level. Within that, housing widens rather than narrows to mean the provision of adequate residential space, indoors and outdoors and so it tends more and more to be interpreted by governments in all the European countries, northern and southern, though it is still in the north that planning is furthest ahead.

Planning legislation in Great Britain as we know it today, is largely based on the findings of three Government commissions referred to in chronological order as the Barlow, Scott and Uthwatt Reports.

In 1937, the Royal Commission under the chairmanship of Sir Montague Barlow was set up to inquire into the distribution of the industrial population, and to consider what social, economic and strategic disadvantages arose from the concentration of industry and the individual population in certain areas and in large towns. This was a formidable assignment, but the Commission made an analysis of the many complicated factors that had influenced the progressive concentration of population and industry, and arrived at far-reaching recommendations for the redevelopment of the congested urban areas, so that adequate living space might be found to accommodate a thinning out of industry and people. The

conception of a balance of industrial employment throughout the country was first developed in the Barlow Report, and proposals were made, again for the first time, for setting up a national central authority to deal with these problems. For housing this presaged a time when, correcting 19th century faults, the housing problem in relation to land available would be looked at on a global basis.

In the early part of World War II, the Scott and Uthwatt committees were set up - Scott to consider the effects of urban spread on agricultural land, and Uthwatt to deal with compensation and betterment, a matter somewhat outside the scope of the present subject of study, although one on which solutions of the problems of creating space for housing in congested areas of certain kinds depend.

The findings of all three committees led directly to the setting up, in 1943, of the Ministry of Town and Country Planning, the first of its kind in the world, the Minister being charged with the responsibility of 'securing consistency and continuity in the framing and execution of a national policy with respect to the use and development of land'.[1] Since that date, several changes in the title of the central planning ministry have been made, and the responsibility now lies with the Minister of Housing and Local Government. In Scotland, the Secretary of State has consistently been the Minister for both housing and planning. Administratively, responsibility in Scotland was first held by the Department of Health for Scotland, then in 1962 in a reorganisation, by the Scottish Development Department.

From this we can see how housing has tended to become part of the planning function, which as we understand it at the present time, is to encourage development of all land in the best possible way. We can also see that the definition of planned development, far from being confined to housing, extends to many kinds of construction,to buildings of all kinds and also to roads. It includes any substantial change of use; for instance, the change, in relation to a particular piece of land, from agriculture to playing fields, a matter which may concern housing closely, and which while not necessarily involving any building, would be called a development in this new planning language.

The development of land, as it actually takes place from time to time, may occur in many different degrees of scale, some of these simultaneously. For instance, in the 19th century, the creation of a railway system in each of the countries under consideration represented large-scale development, and extensive change of use, over a very wide area, carried out by a small number of comparatively large organisations. Similarly, the development work of Forestry Commissions, of Ministries of Transport in relation to arterial and other main roads, and Ministries of Civil Aviation in relation to airfields, all represent basic national decisions about development. On this scale of planning in its repercussions on housing, one could mention in recent times Government action in creating new towns; in the directing of industry to the so-called development areas, whether by persuasion or (as in Norway) by

the creation of favourable taxation climates, using fiscal policy as the tool; and in the creation of national parks, curiously enough omitting Scotland. There has also been a question in all the countries studied of Government taking in hand the preservation of agricultural land, which has sometimes run counter to the interests of housing. In Scotland, this interest nearly led to the stopping of the new towns programme at its very outset in 1947, when it was proved how the proposed new town of East Kilbride would reduce Glasgow's milk supply.[2] Denmark, where this might have been taken very seriously, has led the way in the other direction by showing how rapidly and effectively marginal and unused land can be made into good agricultural land. Such development, virtually a process of land reclamation, for it was perfected in reclaiming the Jutland heaths and peat-bogs, is the work of the 19th century land developer and patriot Dalgas. His starting point was the loss to Germany of the provinces of Slesvig-Holsten in 1864. As a colonel of engineers in the Danish Army it was his function to maintain the Jutland road system, and this led him to see how a richly rewarding programme of forestry, field development and land settlement, could follow from simple extension of engineering from the roads into the unproductive regions on either side.[3] It was the existence of his techniques, perfected over a century of scientific improvement by the Jydsk Hedeselskab, which made it possible for Danes to accept with equanimity the immense inroads into agricultural land resources implied by the Greater Copenhagen Plan of 1959-63. It was the penetration of similar ideas into Scottish agriculture, including vastly increased productivity within existing remaining

agricultural units, that enabled agriculturalists to regroup their resources and accept the invasion of East Kilbride, then of Glenrothes and Livingston, as major extensions of the central Scottish conurbation. An ironic comment on the farming objection to East Kilbride made in 1947 pointed towards that solution of the difficulty. It was to the effect that old gazetteers of Scotland listed the East Kilbride area as moorland, too high and too exposed for effective agriculture. The very farms being defended were themselves the result of a Dalgas-like operation.

All these high-level policies superimpose themselves on more localised activities, which have to be fitted in without prejudice to national considerations, and it is here that a planning minister's function of securing consistency in the development of land in the national interest comes into play in striking a balance, when there are competing claims on land, between local and national needs. As an instance of this possible conflict, shortly after the close of the second world war the Secretary of State for Scotland prohibited the further expansion of Glasgow on three main grounds, unless it were done by means of new towns.

1. That industrial concentration was already too large and any further substantial increase in the developed area would be detrimental to the balance of industry throughout the central belt of Scotland.

2. Any further spread of residential development away from the centre would increase to an intolerable extent the physical problems, particularly of traffic, already inherent in the Clyde Valley Region.

3. Conservation of high-grade agricultural land, round the perimeter of the main urban areas. (This took account, in part, of the farming objection to East Kilbride).

The planning function, whether at national or local level, is by

no means a wholly negative one, a system of prohibitions or restraints. If it were so, its usefulness would be strictly limited, and indeed public opinion would probably, in the end, bring this kind of planning to an end. As it is, the negative side is there, and is naturally unwelcome to those whose plans, including those of housing authorities, are put under restraint. But it is important to realise that this is not the whole story. The restraint on the expansion of cities by themselves - a wholly negative action - could not be maintained for long without more or less explosive results, and so some positive means of coping with the powerful expansive forces must be devised and operated as a complementary action. Hence the establishment of a function of Government, in more than one country, to create new towns. Hence also legislation directed towards the deliberate expansion of existing towns to take the so-called 'overspill' from congested urban areas - and not least of all, the planned transference of expanding industry away from central urban areas. Sometimes such transference is helped, as at Gela, Sicily, by discovery of new natural resources. Otherwise, at this level, the execution of housing and planning policy is both slow and uncertain, and results can only be judged over a considerable period of time. As such policies even in northern Europe have only been in operation for less than two decades and in southern Europe somewhat less, the effect of them on the size and spread of Glasgow, of Paris, of Stockholm or Copenhagen, of Genoa, Milan or Turin can hardly be noticed. On the other hand, the building of the new towns such as Cumbernauld, Vällingby, Ivrea or Gela, each with a proportion of industry and employment, has already

created a number of minor focal points away from the dominating metropolitan area which, in total, may represent an appreciable degree of restraint on the future growth of the parent area, even if from the ideal point of view such expansion areas are insufficient. The positive aspect of planning for a more generous pattern of living then becomes more apparent in relation to slum clearance. The elimination of obsolescent and decaying areas in cities is, in itself, a negative action, but luckily this operation cannot, by its very nature, be abandoned half-way through. A positive complementary action has to be carried out - either by planning a new residential area somewhere else, or by planning a replacement on the same site, or, more frequently, by a combination of both. This is where the problem of the new town and that of redevelopment interlock.

When we look back over the development of solutions to this problem in European countries during the first half of this century, it is evident that the present scope and technique of planning both for housing and other uses is a result of many ideas and forces all of which can be classified under two main headings - negative and positive: restraints, prohibitions, regulations on the one hand - opportunities, creative action, the achievement of new standards on the other.

The degree to which the negative or the positive element is uppermost at any particular time or any part of a country, may vary considerably; ideally, the negative element should be minimum, but in a continent, and such in general is Europe, congested with

many competing claims on land, this is not easy to achieve. Equally, however, we are faced, as the result of more recent history, with the necessity in the near future to plan for very large-scale replacements of property built in great blocks 80-100 years ago. This redevelopment operation, taking Europe as a whole, is a vast undertaking, but obviously gives great opportunity on the creative side, and we are now at a stage when new standards not only in housing but in town planning in relation to the whole residential environment are being thought out. These standards determine the physical conditions under which a substantial proportion of our population will live and work for some generations to come. In setting these standards, many factors must be considered, but the basic factor is always the appropriate living space for the individual family, the basic social unit.

It is true, of course, that in the last 25 years, the activities of the local authorities in the field of housing and slum clearance have eliminated some of the worst existing conditions. The tenemental square, once typical of Glasgow's slums as of those of Copenhagen and Hamburg, is disappearing, and the most acute density troubles of the Gorbals as of Vesterbro have been mitigated. For this reason besides those of advancing medical science, health statistics now tend to take a subsidiary place in housing surveys and reports. This is on the assumption that the relation between overcrowding and insanitary building and health is so well understood and publicly accepted that little more need be said, except to earmark remaining black areas for

demolition and redevelopment as soon as practicable. It is fair to say, however, that while certain basic facts about the effects on physical and mental health of these conditions have been perfectly well known for a long time, when we come to consider standards for the building of new or redeveloped communities, or standards that might be applied to large-scale redevelopment of existing city areas comparatively little scientific data is readily available. When we think about rebuilding substantial areas after slum clearance, or about building new communities such as new towns, or new residential areas on the edges of existing towns, the kindsof question that arise requiring answers in the form of regulations are these:

First of all, density; the number of people to the acre: the number of rooms or dwellings to the acre: these may all be used as scales of density. Densities used in terms of people, rooms or dwellings, are fundamental factors in determining the kind of layout, the type and quality of environment created. We find, in fact, on this fundamental point, considerable differences of opinion. In the Tradeston area of Glasgow, when it was surveyed in connection with the preparation of the Clyde Valley Regional plan in 1946, before the overcrowding of World War II abated, densities of over 700 people to the acre were recorded, and this degree of density was recognised as impossibly high for any reasonable space standards for living. When we come, however, to determining what densities should be used for redevelopment, the question is not so easily answered. In Stuyvesant Town and Peter Cooper Village in lower Manhattan, redevelopment has taken place in the form of multi-storey flats at a density of about 400

people to the acre and this seems to be a kind of world maximum. The County of London plan put the maximum residential density for the central area, a comparatively small area in relation to the whole city, at 200. On the other hand, the Clyde Valley plan recommended for the centre of Glasgow a density maximum of 120 persons. The Gorbals area is now being rebuilt at 140 persons per acre, the Tuscolano development in Rome at 100. Fixing these basic figures, when dealing with large cities, has a decisive effect both on the type of resulting development, and also the number of people who have to be housed elsewhere. Authoritative statements from public health authorities which would help to decide what figures should be used are wholly lacking and the field is wide open for study. The present thesis seems to plead for consideration of types of housing and densities of housing to be decided together. This is still rare, but speaks in favour of the Scandinavian method of defining density on town maps by means of a combination of plot ratio and permitted storey height, just as it argues against the Scottish method of the cartogram giving only a density figure of acres and people.

Similarly standards of open space for recreational purposes show a wide variety. These are generally empirical, based on advancing usage, without scientific backing. When we come to standards of daylighting and sunlight, we are still in the realm of broad opinion, and it may well be that for a long time, we will have to rest content with that. At any rate it has not been felt that this thesis could contribute to that subject. A few years ago prolonged discussions took place in the L. C. C. on the related subject of

minimum permissible heights of habitable rooms. For years the L. C. C. had insisted on a minimum of 9'6". Since the war this had been reduced to 8'6", but the Ministry of Health argued that this could be further reduced to 8'0" based on wide experience by English authorities generally. Many authorities proceeded to allow 8'0" as a minimum and for some years now Scotland has allowed 7'6", after rigid adherence to 9'0". A 6" difference in height, taken over a large number of dwellings, represents a considerable total sum of money, which could have been spent on building more houses or on an extra room for each house, but in practice it was found impossible to relate this kind of difference in standard to considerations of health, although some relation possibly does exist. In other directions, standards are even less precise; for instance, noise, vibration and atmospheric pollution. The first two have a bearing on the planning of main roads taking heavy traffic, on the planning of tube railways, on surface shunting yards, and more particularly in these days of jet aircraft, on the location of airports, but also on housing. An interesting study of railway noise in relation to housing has been made at Cumbernauld by Edinburgh University researchers, suggesting that it be shut out of the town by a rampart of flatted blocks, themselves planned to endure it. Again, in the Regional Plan of Reykjavik now being prepared by Copenhagen consultants it is being recommended that a belt 110 yards wide be left unbuilt on either side of primary motor routes running through the metropolitan area so as to protect inhabitants from motorway noise.[4]

The dangers of atmospheric pollution have become sufficiently realised, and authorities in several countries now have powers to create areas subject to restrictions in the emission of smoke. Some have, in fact, established areas of this kind, notably Great Britain, and Scotland, after a slow start, now has many such areas.

These are some instances of standards necessary for housing to proceed within town planning where action by government is essential to good order. They are standards applied in a field where health considerations merge with standards of convenience and amenity, and it is impossible to draw a precise line between these. It is clearly much easier for a medical officer to say, with some degree of certainty, that a given group of dwellings is sub-standard, in simple terms of obsolescence or overcrowding, or sanitary fitness, than to suggest minima in terms of the kind of standards just enumerated. To the planner as to the housing architect it will become increasingly important, as redevelopment becomes larger in scope, as it will, to have all the assistance he can obtain, from the point of view of public health, in arriving at conclusions on these matters; for thus the traditional scope of public health needs to be widened to include every aspect of environmental health.

This can be illustrated further by an example where a certain choice in the type of development is open to the planner. Let us assume a site of some size, about 10 acres, in the central area of a city. This has been cleared of all buildings and has to be replanned as a residential area, with perhaps a nursery school, some shops, two children's playgrounds, a church and a community hall. The

density is fixed, at 120 persons to the acre. This density determines the total number of rooms allowable, and the proportions of dwellings of various sizes, perhaps a few bedsitting-room units, others of two, three and four bedrooms. These proportions are fixed on the advice of the housing authority, and they might be 5%, 30%, 60% and 5% respectively.

Now comes the question: how are these dwellings to be disposed over the site? Before the war, the universal answer appeared to be a uniform series of blocks of flats, their height depending on the particular city in which the problem occurred - in Edinburgh either 3 or 4 storeys - in parts of Glasgow probably 5 storeys, in Copenhagen or Milan 6 or 7. The result is familiar to us all - a minimum amount of usuable open space - too small to be capable of maintainance as a garden or even as a strip of grass - and above all, even in the continental examples, monotony, for Miss Denby found this ghastly quality present, unexorcised, in some of her otherwise satisfactory cases. Time has moved on, but still we can see in every European city innumerable examples of this kind of development. No doubt the individual dwellings are a great advance on the slums they replaced. They all have a bathroom and a kitchen, and satisfy somebody's minimum standards of area within the individual house - but beyond that, there was little advance on the older type of layout that they replaced. Yet there seemed, at that time, which we can assume to be between 1925 and 1955, little alternative to offer.

Today, however, it is possible to build, fairly economically,

to much greater heights than was possible 20 or even 10 years ago. Eight or nine storeys is no more expensive than 4 or 5, and in most countries we can go to 12-15 storeys without greater expense per dwelling. The technical problems of high building have received considerable study, and it seems likely that systems of constructing them will advance, both as regards speed and economy.

It is, moreover, evident, that if, on a 10 acre site, a small number of tall blocks are planned, two things result. First, as in the Gorbals, Glasgow, a proportion of low blocks, probably in the shape of houses or maisonettes as opposed to flats, can be built, and secondly that a considerable area of ground is freed for other use: gardens, playgrounds etc.; and this, with skilful planning, will not be overshadowed by a continuous ring of buildings, as the 'backgreens' were inevitably enclosed in the older form of tenements of uniform height. The result will be, and has been demonstrated to be, that the same number of people will be rehoused on the 10 acres, but with a difference in terms of daylight, sunlight, and general amenity.

There is, however, the fact that a proportion of people will be living fairly high above ground - certainly above the old maximum of 5 storeys, and it is here that a good deal of opinion becomes vocal.[5] Is living above the 5th storey detrimental to health? To listen to some members of housing committees in Britain and abroad, one would imagine almost that expectation of life diminishes in proportion to the number of storeys above ground, and some seriously contend this. But high building, used in the right way, is a powerful tool both for redevelopment and in planning new communities. Yet human

beings cannot be disposed like counters in a game, and their physical and psychological reactions to unfamiliar surroun dings are capable of study and analysis. The relation between high building and health is not at all obvious and there may be no relation. This thesis contributes little, it may be, to elucidate matters. Yet certain visits and interviews, notably those undertaken at Nantes, at the Gorbals in Glasgow and at Leith Fort in Edinburgh, suggest at least the necessity to have informed opinion take the place of ignorant prejudice, and also that the design and type of dwelling unit of which the tall building is composed matter significantly. In all three examples tenants who could acquire from their dwelling the feeling that it was not just a flat, that it made them feel that they lived in a real house, were happy. This was specific support for the maisonette in all its forms, in preference to any kind of flat.

Whether or not connected with density questions, governments have been forming policies about the planning of residential areas as recognizable units. These have been given various names - the most common in English is the Neighbourhood Unit, a conception that has had wide repercussions in post-war planning both on the development of new towns and new housing estates on the fringes of existing towns.

This idea of the residential or neighbourhood un it arose for a number of reasons: economic, social and architectural. The spread of residential building on the fringes of towns between the wars, unplanned and unrestricted, had many obvious disadvantages. These vast areas of suburbia were not only expensive in roads and drainage; not only were they devoid of architectural or civic character; but

frequently they lacked the essential elements of day-to-day living: shopping centres, schools, community buildings and open spaces.

As the suburbs grew, the journey to and from work in the central or other areas of the town became more and more of a burden, and conversely the country became more remote from those who lived in the older city areas. The day-to-day pressure on local housing authorities to provide large numbers of dwelling units to relieve over-crowding was such that the implications of transferring large numbers of people to new housing areas, in terms of social life, were for some time insufficiently considered, but as the scale of their operations increased, the resulting social problems became too obvious to ignore.

The City of Manchester, developing the Wythenshawe estate in the late 1930's, gave a lead in planning their new housing area as a community rather than an endless number of housing blocks. An area was set aside for light industry, and another for housing by private enterprise; minor shopping centres were planned in relation to the area as a whole, and the main ring road which happened to pass through the estate was designed as a parkway with broad well planted verges and footpaths well away from the carriageway. This was the none-too-well acknowledged prototype for much of the community planning proposals featured in propaganda literature put out in the post-war years in several of the countries under review. But there was also too little regard for the parallel work of Le Corbusier and others on the other kind of unité d'habitation, where the concept is one of a tightly knit group of dwellings, in his case a tower of them or a large

slab containing, besides dwellings, shops, nursery schools, launderettes, and possibly other communal facilities. Again, what discussion has there been about Adalberto Libera's unità d'abitazione orizzontale? Professional bodies and governments alike have paid all too little attention to individual pioneers of the community unit. Yet there has been some application of their work, particularly in the new towns. Policy seems now to be settling in favour of the semi-defined unit, such as Seafar at Cumbernauld, described in Chapter 8. There a unit exists. It has its shops, its launderette, its school and its church, but all of it lies within a few hundred yards of the main town centre. It is a little like the de facto situation at Nantes where Corbusier's unité has some of its own facilities but shares the main ones with the small urban centre at Rezé.

As public housing became an important part of the function of local government, many social surveys brought to light the inadequate planning of the new housing areas, and much thought was given to the theoretical planning of the residential unit. Today it seems to be generally recognised that any major residential unit should satisfy the following criteria.

1. Each should have some definition of shape, size and community structure. Analysis of existing towns has shown that a sense of belonging to a community is frequently due to its physical definition and limitation of size, and in planning a new community an attempt is made to enclose it by some recognizable means; by main roads, by topographical features such as belts of trees, or merely by a change in the type of development.

2. It should be so planned that it has a natural focus whether this is towards the centre or on the periphery. In Scandinavia we see a predilection for the peripheral centre, however paradoxical.

3. Traffic routes should skirt it rather than traverse it, as demonstrated at Radburn: this is indeed a statement of the Radburn principle.

4. It should be of sufficient size to support provision for some day-to-day social requirements, e.g. nursery and primary schools, minor shopping centres and other social facilities. This is the commodity whose variations in provision have followed the fluctuations of the Neighbourhood Unit theory.

5. It should support a degree of service industry, and; according to Mumford, also manufacturing industry.[6]

6. It should not be in danger of becoming a single-class development, as Geddes showed to be avoidable in his Ramsay Garden, developed in 1897.

In practice, the ideal represented by such criteria is seldom attained, but its influences as a theoretical approach to the planning of residential areas is everywhere felt where large scale development is taking place, and the marked difference in quality between the best of post-war housing areas in most European countries and those built in the 1930's is in no small measure the result. Theory can be said to be still a long way ahead of practice, and it is likely that in the course of the next 25 years considerable further advances will be made, as a residue of ideas appropriate to a pre-automobile age gives way to new ones in which architects and others face up to problems presented by the general use of one form or another of motor transport.

Indeed, the idea of the street, as the fundamental unit of urban living, is so firmly embedded in the European way of life, that attempts to dislodge it have met with and still meet much opposition. Interviews undertaken in this study show that this is not wholly a matter of conservative attitudes by authorities but is based too on the attitudes of ordinary people. One example, not illustrated since it is in other ways unimportant, shows how a high wall separating

a new house from a trunk road and providing quietness and privacy, was nevertheless demolished.

It has however, been clear for some time that, unless some practical alternative is not reached fairly quickly, the automobile may well to a large extent cancel out the improvements in housing made in many other directions, and at the end of the day make urban residential life almost intolerable.

The planning of residential units on a traffic-free basis is now progressing somewhat better than a few years ago. The origin was surely Hampstead, but early examples are found in work of the Bauhaus period. Then followed the important work of Tage William-Olsson in Gothenburg, notably the Guldheden unit which exhibited this characteristic in advance of the more famous Lansbury Neighbourhood developed under the L. C. C. In the course of the present study such units are met and examined at Tuscolano, Rome; at Marly-les-grandes-terres, Paris; at Söndergaardsparken, Copenhagen; and, of course, the Seafar district of Cumbernauld, where a whole new town is being created on a principle of traffic segregation.

Success in this aspect of arranging living space means that planning and housing as functions of government must work together, especially at the local level. This situation can be achieved both in central and local government, and in each of the countries studied, movement within governmental organisation has been in this direction. The organisation CEP in Italy (Quartieri Coordinatori del Comitato di Coordinamento per Edilizia Popolare) is a good example of movement in this direction, all the better because it has come into existence in a country where modern planning has arrived late.

For many years, it has been universally recognised that the establishment of minimum standards of housing for everyone is a primary concern of the country as a whole whatever the position of town planning concepts of housing. Such standards are essential to the financing of public housing, whether the provision of funds comes from central and local government as in Britain, co-operative capital as in Scandinavia, or National Insurance as in Italy.

Consideration of standards has, in fact, been widening as the function of providing public authority housing has widened and as government control of private housing has extended, in all the countries studied. Seen from the authorities' point of view, they are a matter of adequate living conditions, certainly; but also a matter of what can be afforded, and no less a matter of the total space required, or in other words a matter of housing need, the point where minimum standards emerge, in terms of minimum public spending.

Faced today with a need to assess housing requirements, that is to say achieving the provision of a generally agreed minimum standard, a separate dwelling of reasonable size for every household, governments get their primary help from their national census undertakings. The countries studied all have similar arrangements for these. In Scotland every 11 years a National Census of population is taken by the Registrar General. The last for which full results are available at the moment of writing was made in 1951. Such a census defines each household as a Primary Family Unit (P.F.U.) which, because of the relationships involved, is assumed to be relatively stable. The P.F.U. consists of the head of the household and his or her near relatives and domestic

servants. It includes adult children and brothers and sisters, unless they are married and have children of their own. It also accepts the grande famille so far as to include married (or widowed) ancestors of the head of the household, living with the family unit. A single person household is regarded as a P.F.U. If there are additional members of the household who do not fall within this definition they are termed the 'Remainder', and the household is then called a composite unit.

The problem in estimating total housing need is to decide how many family groups would wish to have separate dwellings, if they could be provided at acceptable rents. In this connection, married couples, with or without children, or one parent with children, forming part of the 'Remainder' are reckoned, by the Scottish Census, as 'fissionable elements', and are called Family Nuclei (F.N.) with a presumed desire for a separate dwelling. That presumption is not made without some doubts, for it omits the possibility of the single large dwelling capable of housing a complete grande famille of two generations, examples of the need for which have been encountered in all the countries studied. But the evidence is that this multi-generation family is less strong as an institution in Scotland than it is in the other four countries; it is thought by the writer to be strongest in southern Italy, where by custom the grandfather not only lives with his three-generation family, but also rules it as family and household head. Family size varies in each of the countries, being on the average largest in Italy with an average of 5.6 for one generation and smallest in Scotland with an average (from the 1951 census) of 3.67,

an interesting north-south comparison.

When we come to the Census of size of dwellings, (taken in Scotland for the first time in 1951) we see that there are considerable variations in the distribution of dwellings by the number of rooms. Where the national percentage of Great Britain for dwellings with 3 rooms is 11%, regional figures vary from 7% to 22%. For 4-room dwellings the national figure is 28%, regions varying from 21-29%; for 5-room dwellings the national figure is 36%, regions varying widely from 24% to 46%. This touches the problem of the under-crowded house: the 19th century villa, often of 10 or more rooms. Each country has its many examples, though the north may have most.

In the southern regions of England more than 50% of all dwellings were shown to be of 4 and 5 rooms. This percentage dwindles as we come north to just over 30%. In Scotland the proportion is 28%. In Scotland in 1900, when 22,000 houses were built in one year, most of these were of 1 or 2 rooms only, and most of them are still with us in their original form. Even when they were built it would seem that they must have been overcrowded by any standards, and Chapter 8 suggests that this is certain to have been so.

In each of the countries the broad picture usually divides itself in this way:

1. A total number of actual and potential households of known proportionate sizes.
2. A total number of structural dwellings, again of known proportionate sizes.

In planning actual housing programmes, however, a good deal more

needs to be known, to make these programmes realistic, to turn actual requirements into building programmes of dwellings of various sizes, and here, it must be admitted, most local authorities and development agencies are rather in the realm of speculation than of precise fact. In practice it is possible to have a rough idea of family construction and size, requiring rehousing, mainly from the lists of applicants for rehousing, but also from some data obtained from surveys of unfit houses.

The general surveys now carried out in most countries by planning departments covering use and condition of buildings and age of buildings put the location of houses within a wider context than was possible in the past under housing legislation and housing surveys alone. A broad picture is now obtained, not only of those areas of the worst housing conditions, as individual dwelling units, but also of their general environment and its suitability for renewed residential use. An indication is also given by studying an age-of-buildings survey, of those areas likely to become unfit at various periods in the future. The existence of comprehensive planning surveys will make it less likely than it was that housing authorities with their eye both on removing the worst slums and replacing the families who were living there, as the authority must do, will make such bad mistakes as they once did in the location of new replacement houses. One has only to walk through the central areas of any industrial town in Europe today to see how the absence of adequate information and lack of planning has resulted in new housing being built in the most unsuitable places. This seems worst in southern Europe, but everywhere it is the case

that housing built between the wars, still with a useful life of 50 years or so, is today a major obstacle in the way of comprehensive replanning. If Genoa has its examples, actually hindering shipyard extension and baulking shore-road widening, so has Clydebank, and planning surveys everywhere are revealing this kind of wrong site selection. In Great Britain the extension of the old clearance area procedure into a new procedure under planning acts for dealing with areas of comprehensive development has opened up a prospect of more sensible site selection in congested areas than was possible under the housing acts, and the principle extends to several countries abroad. A feature of such comprehensive planning is as often the reduction of road areas as it is their widening, for surveys reveal, too, what a serious amount of land they consume, sometimes a quarter or even a third of the whole area. In selecting housing sites by delineating clearance areas the operation tended to follow blindly the existing road pattern. It was usually the easiest thing to do with drains and sewers already in the streets and no need from an engineering point of view to alter them. Now, with wider powers of development, it becomes possible to think of alternative forms of layout, and to reduce this vast area of hard surface, frequently unnecessary from the point of view of traffic, especially segregated traffic, and very expensive to maintain. It was not enough to say that the houses were necessary, or that the roads were necessary; a context of comprehensive planning had to be created to study both needs together, by calculation, by survey, by alternatives studied on paper.

In general the need for new housing can be calculated in two ways. First, an estimate can be made of the size and distribution of all actual and potential households; another estimate can be made of the

size and distribution of all existing occupied dwellings, and the two lists then compared, based on a standard of occupancy, in terms of persons per room, or rooms per person. This method is, of course, based on the assumption that eventually, all families would occupy dwellings appropriate to their size, that space-provision and space-use will everywhere coincide, an ideal state unlikely to arise.

The second method of calculation is to accept a figure representing the excess of actual and potential families over a known number of existing separate dwellings, break it down into the proportion of family sizes, and convert this into the appropriate number of new dwellings required, again based on a selected standard of occupancy. This method, of course, takes no account of spaces left in existing dwellings by the families moving out of shared premises, but housing authorities and agencies with sights set to raise standards dramatically may care to neglect that.

Whatever method is used, the size distribution of new houses required has to be related to the sizes of the families to be accommodated, with standards of occupancy applied both in relation to existing and to new houses.

From the 1951 Census, households in Scotland sharing dwellings were found to be housed at an average density of 1.08 rooms per person, while those households shown as having separate dwellings were housed at an average of 1.67 rooms per person. This disparity may well be caused by the very large numbers of unofficially divided villas which, just then, many families were sharing with in-laws, on a generous scale

of rooms.

In theory, a redistribution of families to houses of appropriate size might have gone a long way to easing this problem, but it is doubtful whether the large overcrowded families could afford the rents charged for larger houses, and in any case, with the shortage of small modern houses at that time, there was little inducement for small families in larger houses to move, whether they were sharing these larger houses or not.

There is probably no finality in the determination of standards. Public Health and social legislation over the last 80 years contains many provisions dealing with minimum permissible space. Some of it is in terms of prescribing overall cubic dimensions. For instance, beginning with the Glasgow Police Act of 1862, Scotland expressed her housing space standards in cubic form until in recent decades they came to be expressed in terms of floor areas, with separate standards for ceiling heights incorporated into more generally applicable building regulations. France entered the field with standards of floor area, but Italy adopted cubic measurement with the basic requirement of 102 cubic feet per person, of which more is said in Chapter 4. Germany and Denmark have used floor areas but have also expressed space standards in terms of space per person, as in the Copenhagen Housing Commission's report of 1950 where it was recommended that rooms of less than 15 sq. meters should not be used for sleeping by more than one person.

All the countries have at times set standards of over-crowding which are also space standards. A penal standard for over-crowding

appeared in the Housing (Scotland) Act of 1935, which defined an "appointed day" beyond which an over-crowded dwelling could not be occupied without a penal offence being committed, though in general Scotland has allowed a bedroom standard of two persons per room, something Germany, France and Denmark refrain from allowing at the same time hesitating to allow bedrooms to be as small as the 65 square-foot kammer of Danish and German practice. France attempted, without much success, to establish penal standards as regards size, occupancy and physical condition of dwellings inspected by the Commissions Sanitaires du logement which began such operations in mid - 19th century. Italy, with the worst problem of occupancy of all five countries, has not yet attempted this kind of legislation, a realistic attitude.

The problem of unfit and insanitary property has been the subject of legislation in most countries for many years, and there are libraries of Acts of Parliament, regulations and orders now in existence. Generally two basic codes operate in dealing with unfit or insanitary buildings; one code under housing legislation, the other under public health. No simple statement seems to exist in any language explaining the integration of the two, nor has the present writer found any authoritative codification of case-law arising out of operations.

Apart from such dichotomy, standards of fitness or unfitness naturally enough vary considerably from country to country, by either kind of definition.

Section 184 (2) of the Housing (Scotland) Act of 1950 provides that

"in determining, for the purposes of this Act, whether a house is fit for human habitation, regard shall be had to the extent, if any, to which, by reason of disrepair or sanitary defects, the house falls short of the provisions of any building regulations in operation in the district".

It is, therefore, for the local authority itself to interpret this broad definition of unfitness in the light of such case-law as had grown up locally on the subject. It has not, in fact, been the policy or practice of the Scottish Development Department or its predecessors to give local authorities specific advice on the point, as it is, in the last resort, for the Law Courts to decide whether, if there is a dispute about it, a particular house is or is not unfit.

In contrast to this, some more definite guidance on unfitness is given to the English local authorities in the 'Housing Repairs and Rents Act, 1954': Section 9 (1) of that Act states that:

"in determining for any of the purposes of the Act whether a house is unfit for human habitation, regard shall be paid to its condition in respect of the following matters:
(a) Repair; (b) stability; (c) freedom from damp; (d) natural lighting; (e) ventilation; (f) water supply; (g) drainage and sanitary conveniences and (h) facilities for storage, preparation and cooking of food, and for the disposal of waste water."

The house, under this English code, shall be deemed to be unfit if, and only if, it is so far defective in one or more of the matters mentioned, that it is not reasonably suitable for occupation in that condition.

A similar provision was not adopted in the Scottish Act of 1954, as it was then thought that such guidance might in practice be more confining than helpful. On the one hand, the Scottish code makes specific reference to standards set by such local building regulations as may be in force at the time (before the building regulations were

standardised); on the other, general criteria are laid down in the English Act, and indeed subsection (3) of section 9 of the English Act of 1954 makes it clear that in this matter of the definition of unfitness, no account is to be taken of local byelaws or of any local enactment which specified defects, and by reason of which a house is to be deemed unfit. In other words in England the Act takes precedence over the local building byelaws, whatever they may be, if there are any.

Building byelaws, as a form of building control by local building authorities, have wide repercussions, not only in relation to unfit property, but also, and particularly in relation to standards for new buildings. In Scandinavia, where capital cities are the predominant urban areas, such byelaws are often the only regulation, and are copied by smaller municipalities.

Regulations controlling the way buildings shall be built, and also controlling their relation to each other, and to public streets, have been in existence in all the countries for a very long time indeed. Without going back as far as the Romans, who had their own codes for urban building, it can be said that the Great Fire of London in 1666 gave the local authority a renewed consciousness of the necessity for strict control of buildings, in the interests of public safety, and at that time a number of regulations came into force, dealing particularly with the way that timber could be used in the construction of buildings, and space about buildings, ~~that~~ which in one form or another have persisted until the present time. Similarly, Copenhagen and Paris have made

anti-fire regulations, and in the 19th century followed with those made under public health. In modern Britain, as in France and Germany, such regulations must derive from an Act giving local authorities power to make regulations, and must be approved by the appropriate Minister. This is a reasonably flexible form of control, as regulations may be altered from time to time, as circumstances alter, without the necessity of going to Parliament. On the other hand, it is a form of local control that suffers from the fact that the regulations may vary from locality to locality, sometimes to the confusion of the building owners, who may be allowed to build in a certain way by one authority, but not by an adjoining authority. There are many examples of this disparity, and the writer has been told how, particularly in Italy, the local surveyor il geometro has power on his own to decree how building is to conform to regulations much less explicit than those of northern Europe. In general, it may also be said that building regulations grew up over the centuries, as a result of experience, trial and probably error. Certain forms of building construction were well known to be sound, and these became embodied in the byelaws as mandatory. For instance, byelaws right up to World War II would specify that walls of certain heights should be of certain thicknesses, because, by experience, it was known that, by traditional methods of building, heights and thicknesses had become related, in terms of good building; that is to say, in terms of stability. Public safety is, of course, much dependent on the certainty that buildings will not fall down - or at any rate will not very easily fall down.

In 1937, the Department of Health for Scotland issued its first model byelaws for regulating building, in terms of the Burgh Police Acts, the Housing Acts, and the Public Health Act of 1897. These model byelaws were prepared as a guide to local authorities, who were free either to adopt them as their own or not, as they pleased. In practice, some did, some adopted parts of the model, and others had no byelaws at all. The position was further confused by the existence of different bases of legislation as between towns and rural areas, and also that the byelaw legislation discriminated between different types of buildings. Some provisions only applied, for instance, to dwelling houses, but not to other types of buildings. Where no byelaws existed, the building owner was entirely in the hands of the local officials, who made up their own minds, like il geometro in Italy, on permissible standards in the light of their own knowledge and prejudices. This unsatisfactory position with regard to building legislation was examined in great detail after the war, and as a result, an entirely new form of model byelaw came out in 1954. The main criticism of the previous form has been that, in general, they required the use of certain materials and methods to be used in a certain way, thus shutting the door on new and more scientific ways of building. The new form was drafted as far as possible in terms of functions which have to be performed by the various parts of a building. The requirements for a particular function generally took the form of a performance standard, which specified to what degree the building, or a particular part of a building, must be capable of performing that function, but did not

make it obligatory to adopt any particular form of construction.

There was freedom to use any material and any form of construction to achieve the required standard. This, of course, meant that designers who used unorthodox methods or materials had to be prepared to prove, by demonstration or calculation, or by reference to scientific analysis, say, by the Building Research Station, that the methods proposed would in fact meet the necessary standard, and perform the function required. This meant that a higher standard of technical knowledge on the part of those who administer and interpret the byelaws became more necessary than in the past: but it also meant a greater measure of flexibility in building method, and greater advantage could be taken of the scientific solution of building problems. All this has been ~~taken~~ codified into the new Building (Scotland) Act of 1959 Regulations. To a very large extent such codification has been helped by the development of 'British Standards', becoming more and more part of designers' equipment today. These are set by the organisation known as the British Standards Institution, which came into existence some 60 years ago in response to the growing necessity to set national standards for building. British standards now exist for a long list of things, not necessarily closely connected with building, but still mainly so. This organisation, partly sponsored by Government, partly representing manufacturers of building materials, scientists, engineers and architects, and many other interests, is continually expanding the list of available standards. The organisation has a committee structure dealing with four main sectional interests - Building; Chemical; Engineering; Textiles. There are no less than

2,500 committees continually at work on standards, and over 2,000 standard specifications now in existence. The point of all this in relation to building control, is that once building byelaws are based not on rules-of-thumb, but on performance standards, it is obviously important to have an authoritative pronouncement as to what building standards should be, and all the way through the model building bye-laws and their successor, the Building (Scotland) Act Regulations, are references to British standards, and to their complement, British codes of practice, the latter being codified statements, by the British Standards Institution, of acceptable building practice in relation to particular building operations.

In all the countries the production of standards and codes of practice is in process of evolution, and is not likely to reach finality, as scientific progress is made in the use of existing materials and also in the production of new materials, and the development of new methods of building. But there is now in existence generally a sufficient body of codified knowledge of this kind to ensure the working in practice of a system of building control based on performance standards.

In Denmark and in Germany, control of building standards has been by city governments rather than parliament, which in consequence has had to be content when passing parliamentary legislation dealing with housing to include only broad standards of space and occupancy of space. Scandinavian and German municipal statute books, on the other hand, contain complex provisions governing every least detail of permitted building practice, accumulated over the years. Denmark

benefits, by comparison with Germany, by the fact that Copenhagen is so big and so important in relation to other Danish urban communities that the Copenhagen Building Law, a well-revised embodiment of good building practice, has been possible gradually to apply to the whole country and it is the basis of a new National Building Law now (1964) in preparation.

In France certain very old byelaws impose the survival of out-of-date methods and practices, such as unnecessarily thick party walls, and also impose burdens on developers which are not in accord with general conditions of modern business, such as the builder's responsabilité decennale. Other byelaws of more recent date, inadequately studied during compilation, have the effect of paralysing architectural designing to such an extent that it proves necessary from time to time to amend the byelaw in order to allow an important piece of building to proceed. French architects complain, too, that, on the whole, regulations about refuse and sanitation are out of date and impose obligatory solutions which lack common sense.[7]

In Scotland, it should be added, there is widespread discontent with the binding character of the new building regulations, not least when applied to housing, and in particular it is suggested that, in assessing the performance standard, the onus should not be on the developer to prove that his design reaches this, but on the authority to prove that it fails.[8] This, it is thought, would have the salutary effect of putting the progressive architect into an attacking position instead of the defensive one which he is generally forced to adopt. The classic examples of these difficulties are those of Corbusier,

first at Pessac, then at St. Dié and again at Marseilles, but there are architects in each of the countries studied who have experienced similar set-backs and frustrations in their attempts to advance the very conditions of space-provision and facilities for space-use which the frustrating regulations and their administrators are, in another way, also seeking to advance. To this painful and paradoxical situation none of the countries studied seems to have contributed any complete solution. On the other hand, as local authority technicians reach higher levels of qualification than their rule-of-thumb predecessors, a technical dialogue becomes possible between architect and scrutineer in which the progressive solution can triumph. The hope is that such a favourable situation is on the way.

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5. For a high-grade example of opinion voiced, see the RIBA's "Family Life in High Density Housing", 1957.

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8. At an RIBA Council meeting in 1962 the new Scottish regulations were described as "a piece of knitting in a complicated pattern" by the chief architect of the Ministry of Housing and Local Government, who warned against adopting anythin g similar for England and Wales.

CHAPTER THREE

SPACE PROVISION AND SPACE USE IN PRACTICE

On the basis explained in the Foreword, it is assumed that space-provision and space-use will not always be consistent with one another, indeed may more frequently be inconsistent. It is therefore proposed in studying examples to note the degree of inconsistency, at the same time discovering as far as possible its reasons, by tracing on the one hand the intentions of those who provided the space, i.e. the developers, their architects and the local authority scrutineers working under regulations; and likewise the intentions of the people who use the space provided, i.e. the occupants.

Under perfect conditions, such as those people hope to create when they employ an architect to design their dream house, and give him freedom to do so, the provision of space and the use of space may be expected to coincide. If they do not coincide, the difference between them can then be said to be the measure of a failure. It is often declared to be a failure in the architect and client relationship and in no uncertain terms. Conditions, however, even in making a dream house are generally in some way imperfect. There may be too little money, the site may have things wrong with it, and official regulations may decree space arrangements and constructions which are not wanted.

But there is another kind of situation where the space-user has had nothing to do with the space provided and it in consequence does not in any way fit his requirements. It leaves him to improvise as best he can if he is energetic and possesses initiative, or else to settle down to live under hopeless conditions, if he belongs to the

category of those who merely aquiesce in misfortune. At that lower end of the scale of space-users we find the slum dweller, suffering under two deficiencies. The first is that he has too little space; the second probably is that, within that space, services have not been provided adequately, leaving deficiencies in sanitation, lighting, cooking and heating; perhaps also the space arrangements are such that too little daylight and sunlight are present.

Between these extremes lie an infinite number of graded achievements, where space provision and space use, though not coincident, have been brought into a workable conformity, or have been adjusted in some other way, such as extension of the house, whether or not this is undertaken professionally (an increasingly common kind of architectural engagement in all the countries) or amateurishly by the householders. The problem of the extendable house is a serious one, especially in developments such as those of local authorities and housing associations where the units are repetitive and by their economically designed grouping preclude individual extension. The obvious case is the block of flats. Are we at the stage where some tenant might be allowed to project a room from the outside wall of his block like the corbelled and cantilevered projections seen clinging to the walls of old street facades, in mediæval towns in Tuscany, perhaps, or as shown on old drawings of Edinburgh? Northern and southern Europe have each allowed this in the past. This thesis has not revealed examples in modern housing, but it has revealed the problem, as at Ivrea in Chapter 4 and Wassmannstrasse, Hanover, in Chapter 6, where families with

growing children need an extra bedroom. This open question is taken up in Chapter 9, under the heading "conclusions".

Meanwhile, in most dwellings which are not of the one-off kind (where extension can be provided for in the original design) much of the existing space-use is not only pre-determined by the plan but also by the services. It is difficult to use a bathroom for any completely different purpose from that of ablutions. The proverbial "coals in the bath" space-use, recorded in Glasgow, Copenhagen and Hamburg, is not one which happens often and the undocumented case in Edinburgh in the 1920's of the bathroom turned into a stable for the use of the hurdy-gurdy pony belongs to folk lore rather than to serious housing study, though the present writer believes it happened. Similarly it is difficult to use a kitchen for any other purpose than the preparation of food unless it is the extended use of the kitchen for the consumption of food or its conversion temporarily into a laundry, in the absence of any other provision for washing clothes. Taken together, the kitchen and bathroom form the utilitarian core of the house used for the purposes for which they are designed. It is then obvious that the provision of services is a determining factor in the allocation of space for them and for the rest of the house.

This is something the various countries have found themselves handling with considerable differences. To begin with, there is an absence of services altogether, then they begin to appear in the north, Germany leading with the sewerage system of 1842 designed by Lindley, the English drainage engineer, and following this with advanced systems

of servicing the mietskaserne described in Chapter 6. Scotland, a close second in sewerage, goes ahead in the use of gas, for lighting streets and houses.[1] Denmark, poor in metals, economises in piping and makes early use of what is now called the one-pipe system, with grouped kitchen and bathroom. Scotland takes soil waste down the centre of the house but kitchen waste down the rear facade, separating the two rooms. This is pronounced correct by Baurat Klein in Berlin but wrong, in the sense uneconomical, by the Bauhaus architects. The French place both rooms on narrow internal courts and thus destroy these for any other use than that of ventilation shafts or light wells. The Scots then take the bathroom to the rear facade to join the kitchen, but later (encouraged by French acceptance of Corbusier's service-core idea) allow it to go back into the centre again though without allowing the kitchen to go with it. And so the merry game continues. Consistency is not to be found, nor is there much consultation with the people most concerned, the occupants. Since the matter is one of sanitation, the authority to decide it is that of the public health expert who, like others, disagrees with his peers and with his administrative colleagues, not to mention his political representatives. When, for example, will English and Scottish experts agree whether the W.C. is to be a separate room (without a hand-washing device, as in England) or a fitment in the bathroom, inflicting there its smells (as in Scotland) ? The obvious solution, that it must go into its separate compartment but take a hand-basin with it is prevented from acceptance by the arrival of the French bidet, which would have to go in there too. Or is that the solution ?

Sweden, not part of the present study, seems to be saying that it is, but her advice is tainted in the ears of other countries by the fact that she alone has the money (and the comparatively reduced problem of uninhabitable slums) to be able to afford such luxury.

The public health aspects of the decreed provision of space in housing rests, of course, on the firm basis that in the 19th century this science was the effective instrument of housing amelioration, but its judgements often seem now to rest on obsolete conceptions.

It looks as if the stated requirements of air space in bedrooms are to keep away certain respiratory diseases and the avoidance of unlit spaces an effort to keep effective the bactericidal effect of daylight. But are these needs still paramount ? Only widespread consultation between architects, doctors and social and medical service administrators could now decide any new list of public health priorities in the design of the service core of the house.

Again, much housing space-provision today has social reasons or reasons having social origins only to be discovered by digging into wont and custom as indicated in Chapter 1 and through this process unearthing decisions taken long ago as the basic processes of housekeeping and its enjoyment by those for whom the house is kept became established. Some are likely to be connected with architectural custom. This includes the selection of building materials and methods of construction. It also includes the predetermination of such things as window widths, door heights and the spans of floors, ceilings and roofs, where these are not merely the result of regulations and byelaws. All such details of architecture are bound to have affected

and to be affecting the space arrangements which houses have contained and still contain.

Yet other reasons for space arrangements may lie rather in the field of town planning: the adoption of a house type arising out of the street type, conforming as in Georgian Britain with a pre-conceived townscape, such as we meet in a different form in the garden cities on the one hand or on the other the modern comprehensively redeveloped city centre.

Even in a Europe which has widely consented to a certain degree of regimentation of its domestic architecture there remains some incidence of space provision by idiosyncrasy, reasons which originate with fancy, expressions of the imagination rather than efforts of the intellect. The bedroom-bathroom at Hornberg in Chapter 6 is an example. Partly because the housing movement has been so deadly serious in its general social intent, we cannot expect fancy to play more than an occasional part in the design of the housing scheme house, but in his travels the writer has found in each country visited evidence of profound truths about an individualism which may yet come to general expression when this age's conformism has worn thin.

Custom is considered in the course of this thesis regionally, nationally and internationally, as the sequence of fashions and customs spreads from region to region and from one country to another. Long ago in any locality both the provision of space and the use of space were largely determined by local custom. A dwelling high on the 8th floor of an Edinburgh "land" was unlike any of its contemporaries in London.

Different again were houses in Paris and in Rome, Berlin or Copenhagen. Conversely similarities were to be found in areas geographically separate but with similar cultures, and the remarkably homogenous character of older European rural housing is an illustration of the strength and the unanimity of the peasant tradition in housing throughout Europe in times past, until, as already said, it became indistinct in the Industrial Revolution.

What is seen today is perhaps a reversal of that phenomenon. Today standardisation between areas geographically separate is that of the city-dweller whose life, whether he lives in Scotland or in Italy, in Rome or in Edinburgh conforms to a type as homogeneous as that of the peasant used to be. He (and no less important, she) is conditioned not only by bathrooms and kitchens which look much alike wherever in the house they may be situated, but by an office routine, by typewriters and telephones; by television sets; by newspapers, trade unions, salary scales, and the standardised education of the children, which varies only a little from secondary school to lycée, to gymnasium, and to collegio.

Just as the peasant culture of former days invaded the towns and invested them with regional and national characteristics, so today the city dweller is investing the countryside round his city with his kind of international characteristic. Thus rural housing now follows the trends of urban housing. In the more industrialised countries, but chiefly in Britain, the use of space in a rural cottage will be found to be more influenced by that of nearby urban settlements than by a distinctive pattern of activity which the rural householder traces

in his own daily life.

In setting out to compare the provision and use of space in northern and southern countries, it is therefore not expected that wide differences with strong powers of survival will be found. Indeed, evidence tends to show that the internationalisation of all architecture is being accompanied by a deliberate borrowing of regional and national characteristics between north and south. Courtyard or patio houses, being in former times as already described a prerogative of mediterranean civilisation, are being built in droves in northern countries. Similarly the English terrace-house, once upon a time regarded as the outstanding symbol of English urban civilisation, bearing the distinctive Georgian stamp and different in its essentials, as Rasmussen has pointed out,[2] from even the civilisation of nearby Paris, is now being built in Italy after extensive use in Holland and in pre-war Germany. Housing produced by the Olivetti Company for its staff at Ivrea may possibly be among the best terrace houses in the world, more English than the English, even to the extent of the flower gardens which blossom in the Piedmont climate so much more easily than in even the Home Counties.

Viewed optimistically, the total result of these trends towards borrowing of ideas on the one hand and the search for universal formulae on the other may be that of enriching space provision everywhere. If that is the case, and if this enrichment is accompanied by an adequate development of architectural and sociological skill in the coincidence of space provision with required space use, then indeed a golden age of domestic architecture opens before us.

Pessimistically, a danger may exist that over-standardisation will result in a dull average of achievement, in which the best ideas are lost in a general mediocrity.[3]

Provision of domestic space generally falls into four categories. First, because it is most in the public eye, is the standardised modern dwelling produced either directly by central or local government or under government sponsorship. This is the Council housing scheme of the British Isles, that of the Housing Association in Scandinavia, the Groupe d'Habitation (H. B. M. or H. L. M.) of France. The second category is the "one-off" house whether or not designed by an architect, built for the use of a particular family, space being provided according to the use predicted by that family for itself. The third and fourth categories, broader and numerically more important in most countries, are the standardised dwelling and the one-off dwelling when they have passed into obsolescence and qualify either for improvement or demolition. In one sense the last two categories are more alike than the first two, for the distinction between the one-off house and the mass-produced house tends to lessen as time goes on. Even if we only go back five or ten years - a comparatively short period in the life of a house - we are unlikely to find in many cases that even the most carefully designed one-off house still is occupied by the family for whom it was built and in the way it was designed. In all probability the next family to acquire it will have found themselves obliged to adapt its space provision to their different space use. This problem of obsolescence confronts the occupants of any dwelling as it ages. In solving the problem,

the degree of flexibility with which the original design is gifted becomes decisive, together with the readiness with which the obsolete services can be brought up to date.

Here and there in the case studies submitted to illustrate this thesis are examples of obsolescence cleverly dealt with. In other examples, the ideas for dealing with obsolete conditions are there but not the means or the opportunity to carry them out. Generally, this thesis is content to rest its emphasis on another aspect of age, that of habits and customs formed by living in houses of traditional shape and size. This habit-forming quality which all houses have, and every environment has, may be expected to retard in some degree the current internationalisation, standardisation, and generally the movement to be modern at all costs. We may expect to find that even in the most deliberately modern environment, the architect-designed house consciously and deliberately emancipated from tradition, the hand of tradition and custom will be present, if not in the design of the house itself then certainly in the furnishing, but almost as certainly in such things as the local government control under which it is erected, the climate and vegetation with which it is enveloped, not to speak of the materials of which it is built. All these things, whether they are described with the word traditional or identified only with locality, are likely to have a bearing both on the provision of space and on the use made of it.

Here the same categories apply and in each it is intended to invest the term "space use" with an identity of a personal kind

deriving from the space-user. In the first category and the second he is the client for whom the house has been built, or the occupant put into it by the client. Both expect to find a well-provided space arrangement. In the third and fourth he is the person who arrives to occupy the house through some historical accident or set of circumstances, in which he is not expecting to find, indeed knows he will not find such an arrangement. The perfect coincidence between space provided and his own wishes for space use not having occurred, he proceeds to adapt what he finds to suit his family. In the process he may disregard cherished architectural concepts and through ignorance of them or intention flout byelaw and other legislative requirements. He is at liberty too to disregard his own convenience if something else supervenes such as his pride or his wish to conform to some custom which decrees inconvenience. Any of these things may take charge of his actions and may determine a space use which from an architect's point of view is irrational and wrong. This study brings to light examples of such space use, though they may not be possible to explain within the present scope and so be allowed to remain phenomena of behaviour awaiting explanation in socio-psychological or in socio-anthropological terms. An example is the thoroughly illogical summer cottage at Svejbaek in Chapter 5, where pride seems to have led directly to substantial inconvenience, in a country where convenience normally seems more respected than pride. It is, alas, these effects which put the common mark on the dwellings of any age or society. They are used later on by the historian, still later by the archeologist to determine

when, by whom and for whom they were built. Anonymity is the individual space-user's fate, but while he is living in his dwelling, however anonymous it is through regulation and custom, he has a power of self-expression through the space-use he adopts. This is an art. It is not the art of architecture, though it may contribute to architectural effect. Perhaps it is a department of the art of housekeeping, but it is an art having common features, the one household with the other, within a given country, region or district, and yet everywhere it leaves room for the individual flair. This, surely, is why the contents of folk museums with their real or reconstructed interiors draw together into a consistent whole the museum's collection of miscellaneous artifacts. The use of domestic space so demonstrated in a museum may appear a little precious: too orderly to be human. Yet this quality too pervades many a house, for there seems always to be a certain stylisation of this aspect of housekeeping; of artefacts arranged according to a pre-conceived and even pre-ordained pattern which as time goes on may have little to do with the functioning of the home as such. It may have as its objective something not unlike the purpose of a museum in one respect: to represent the home to someone other than the occupants. The objective may even be to represent something else than the home. This something else may be an abstract or partly abstract characteristic, such as wealth, poverty, respectability, gaiety, piety. The list is long, for here we have to do with the aspirations of the family in its home and in its society. The home not only contains the family living in it from day to day functionally,

but also symbolically and the symbol may be that of a hoped for apotheosis: the family, being or aspiring to be something else than it is, like the Trifler's Household in Goldsmith's shrewd observation of this kind of pretence in 18th century London which took place in a "dismal looking house in the outlets of the town."[4] Yet the fact that the expression "status symbol" has recently come into accepted use shows how easily this kind of thinking about the artifacts of daily life reaches beyond mere daily needs towards things aspired after, like Samuel Pepys and his "closett" with its "new presses for my books . . . maps pictures and draughts . . . to my most extraordinary satisfaction . . . as noble a closett as any man hath."[5] Unlike the Trifler, and a century before him, Pepys saw his aspiration achieved.

The demand for more space, sometimes on the part of the provider but more frequently that of the user, we may expect to encounter in widespread manifestation. Probably it runs by cycles, the dwelling starting as a type at some given point of origin in a historical period or geographical region as a simple thing of one or two rooms, then others being added while the first are enlarged or embellished or both. Such cycles could be part of a recurrent pattern of social with economic development. Since Pepys, the typical English town house has passed through three such cycles of birth and growth, then virtual extinction and rebirth, starting soon after his time with the Georgian terrace, then the Victorian villa, followed by the types of today amongst which appears as part of a separately cyclic development the multi-storey

flat. Each type has grown until in one sense or another there is no more room for it, whereupon it disappears in demolition and redevelopment, when a new start is made. This is only just beginning to happen to 20th century houses and in the sheer waste involved, not only of buildings but of ideas and carefully developed human customs and habits of living, regret may be felt especially when the new start is made in conditions cramped either from lack of space or lack of money. From this point of view space-provision today seems everywhere bedevilled by lack of both these things, and it remains to be seen whether in fact the very width of the unprecedented humanitarian stream, which insists today that everyone is to be rehoused to new space and equipment standards, is bringing defeat by encountering an impossibility: that even with the help of technology mankind cannot yet rehouse itself within one or two generations. To say that because of a universal demand there must be created a universal supply may be to tax production beyond its capabilities. The demand for better housing today is universal, and it is primarily a matter of more and better space. The pressure on production is enormous, as licensing systems, government - set starting dates, quotas and other restraining devices show. The need for architectural research to improve production qualitatively and quantitatively, is a constant cry, which speaks of a deeper need to satisfy, not just a general inarticulate demand, but specific demands. These are for more space to be shown by research to be necessary, since authorities will only listen to research findings; for better arranged space shown by

research to be possible within available money resources; for better equipment to be developed under research conditions. Pressure for things to be provided comes from tension within. This is a tension between space-provision, restricted by shortage of resource, and cramped space-use resulting from demands not met. It follows that in making use of restricted space, occupants reduce this tension by their own skill in space-use. As certain case studies show, inconsistency and tension between supply and demand, between space provided and space wished for, is in process of being resolved, in various degrees of success in various countries through co-operation between provider and user. This is aided by efforts made by suppliers of furniture and equipment to design and produce at reasonable cost artifacts which perform their various domestic functions within a minimum space. Certain case studies show how excellent the result can be where such co-operation is at its best. Others show how complex and difficult the process of space use can become when co-operation breaks down, because the provider of space has failed to plan it in a way likely to be of use to the user, or because the user's skill has failed him in making use of the space provided, or else because the furniture and equipment available to buy, or presently in the user's possession - he being unwilling to part with it - is of unsuitable design. The Trifler, who lived in a multi-storey building "as high as the stairs would permit us to ascend" euphemised the position of his flat as "the first floor down the chimney". He had furnished his "chamber" with pathetic skill: "... four chairs

with old wrought bottoms, that he assured me were his wife's embroidery; a square table that had once been japanned, a cradle in one corner, a lumbering cabinet in the other; a broken shepherdess, and a mandarin without a head were stuck over the chimney; and round the walls several paltry, unframed pictures... all his own drawing".[6] This dear good-natured creature, as his loving wife called him, seems to have done his very best as a space user, but came to grief in his pretensions to be what he was not, and what his furniture and his dwelling could not convey to him. As will be shown, he is not extinct. The writer met him at Cumbernauld. Nor is Samuel Pepys, that successful grappler with situations, the success of whose new "closett" was only assured by careful planning with his Joyner: "he and I with great pains contriving ..."[7] His counterpart today is, surely, the handyman-husband busy in the kitchen knocking up skilful gadgetry with his carefully filed home-culture magazine pages laid out in front of him. Case studies in more than one country encounter him and his effect on his house. The Joiner, on the other hand, in some countries at least, works in a factory, where he has become so skilful a provider of the right shelves and such well-dimensioned gadgetry as to reduce the need for contrivance and send home joinery into a new phase: that of assembling units or other pre-fabricated parts of furniture and equipment selected not from magazines but from catalogues.

If it is in the home that the Trifler displays his pretence and Pepys his status symbols, it is also there that each is himself to

himself, to his wife, to his other intimates. He is himself in private, and the theme of a search for privacy runs, as we have seen, through the history of the house. The search still goes on, and in modern housing of most kinds the architects' skills are applied to the problem, often acute, of finding it. The smaller the site, the smaller the dwelling, the closer it stands to other dwellings - it might be thought - the less its privacy. But here too ingenuity can win back what poverty has lost, and in the space-restricted modern dwelling and group of dwellings, interesting successes in the search for privacy, in house and adjoining open space, have been recorded in the course of this study.

Of these, two kinds seem of particular importance. The first is the maisonette with its adjoining balcony as displayed in the early work of the Corbusier, then later in his demonstration blocks at Marseilles and Nantes, and later still developed in other countries, lastly in Scotland. The second is the courtyard or patio house, revived from the ancient world - the "introspective" house (as the present writer believes he first called it before the name reached publication in London in 1960). Both are examined in their original and developed versions as at Grenhusene in Copenhagen and Hutchesontown in Glasgow, and an exceptional example of them combined is studied at Berne, though outside the countries with which the thesis deals. The trend represented by these privacy-seeking designs is followed in the thesis' conclusions into a study of projects not yet built, in the belief that such is generally the shape of things to come, and where it seems possible that some

of the more important properties of the one-off "private" house may communicate themselves to the design of those mass-produced. Examples, too, have been found and studied where people living in older dwellings, in the midst of obsolescence, have found means to create for themselves the kind of environment these projects promise to bring to general achievement.

In practice, then, space-provision and space-use are not primarily a matter for set standards and static levels of achievement, once reached then maintained. Rather are they a matter for constant development and change, for trend and counter-trend, as mankind continues its general pursuit of a happy environment to live in.

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2. Rasmussen; London, the Unique City. Ch. 9.

3. ibid; end of last chapter. 1st Edition.

4. Oliver Goldsmith; The Trifler's Household; The Citizen of the World No. 54. 1760.

5. Samuel Pepys; Diary, 24th August 1666.

6. Oliver Goldsmith; The Trifler's Household; The Citizen of the World, No. 54. 1760.

7. Samuel Pepys; Diary, 23rd July 1666.

The presses took a month to make in Sympson's workshop. They were given doors, had overhead a cornice, and Pepys separately ordered the backs of his books gilt. Twelve of these or other similar presses or bookcases are now at Magdalene College, containing his 3000 books in the order in which he left them.

CHAPTER FOUR

ITALY.

It is difficult to write about Italian housing without some reference to two well known sets of circumstances. The first is the existence in Italy of fascist government for those two decades after the first world war which were formative years for European housing generally and gave to Italian housing a particular form. The second is the renaissance of Italian architecture which, from quiet origins during those decades, unfolded into spectacular achievement in following decades, and, freed from fascist influences, became the formative influence on Italian housing after the second world war. These two sets of circumstances are generally understood to be important for Italian architecture as a whole, but their effects on Italian housing seem not yet to have been the subject of much examination. Even where political and architectural circumstances interweave, as they do in an obvious way in 1945, when the new democratic regime and an emancipated architectural profession take over housing from their predecessors, observers outside Italy are not found watching intently for results. Some might have watched, if only to trace for the record, happily or otherwise, the assimilation of ideas from the old regime into the new housing practice; or their rejection, or the incidence of new ideas. But whether watched from outside or not, the tightly woven fabric of politics and architecture which has always characterised Italy continued to characterise her.

A particular aspect of this interwoven political and architectural fabric relevant to the present study is its effect on the attitude Italy has adopted, before 1945 and after, towards the northern democracies, where the seeds of the modern housing movement can be said to have germinated, and the attitude they in turn have adopted towards Italy. On the one hand Italy found herself embarking before the fascist period on housing arrangements which were taking a similar course to those of the north, yet on the other hand retarded from reaching during the 1920's and 1930's the objectives which some at least of the northern democracies can be said to have reached. It became habitual for north to judge south, and even after 1945 it remained a habit of thought in the north of Europe that the discredited fascist regime had so hindered social progress that the new Italian architecture could only slowly and with difficulty extend its influence to housing as to a cause hitherto lost. Such was the air affected by architectural journals as late as 1955, with their careful captioning of Italian housing examples. Even Domus wore this air in dealing with housing, as if progress made in the northern countries and standards adopted there must be in some way the criterion for judging Italian achievement. Only more recently has the climate of thought changed towards favouring instead a search for Italian reasons for doing Italian things. This is the approach adopted in the present study, accepting the

fascist years as themselves an Italian phenomenon with effects to measure and compare with those of political phenomena elsewhere; for which of the countries studied has not suffered in some way from lack of political grasp of the housing problem? It may then be that what follows in this chapter adjusts in some respects the accepted impression of things as between northern Europe and southern. At any rate it shows that a superficial judgment that in housing matters north always leads south is not supported on evidence when the search for evidence is taken beneath the surface.

To look beneath the surface of things in Italy soon reveals unexpected facts. One is that an undercurrent of social progress was maintained throughout the fascist period by people who either defied fascist influence or else managed to keep the current of progress moving without attracting political notice. Another is the fact that modern Italian architecture did not just burst into existence after 1945 but had a steady process of development extending back to the 19th century. There was no Italian Bauhaus, no Weissenhof exhibition of modern Italian domestic architecture. But neither was there much exodus, still less expulsion, of Italian architects when fascism took over, although some fell foul of their new masters, notably Giuseppe Pagano, who died in Mauthausen concentration camp. Again, with no Weissenhof exhibits to label with the Italian equivalent of the Goebbels term kulturbolschewismus, Mussolini's policy in housing could not begin with a total denigration of the modern movement in design.

Besides the steady advance of modern Italian architecture, slower but surer than that of Germany, another fact discovered is the similarly steady advance of industrial technology. This is an impressive story of effort for a country with such belated industrialisation, whether we are considering wartime production of armaments or peacetime production of those ranges of consumer goods which the ordinary person, including the ordinary Italian, wants to own and have in his house. It is easy to attribute the excellence of such things in Italy today to modern international industrial design, but the consumer requirements arise from an accompanying process of consumer-consciousness which has been developing down the years. It cannot be maintained that either the Italian producer or the consumer has thought things out in isolation from production or consumption in other countries, for it has all the time been possible for Italian designers to draw upon non-Italian sources in their search for solutions to problems of design and production. But they have made their selection with great skill. It might be reasonable to conclude that, in the modern Italian renaissance of architectural and industrial design, as many foreign ingredients are present as there were (to make an obvious comparison) in the Renaissance of 400 years ago. This is another way of saying that if the reasons for doing things are Italian, the things themselves may not be; yet they acquire Italian character in the process of being done.

It is of some importance here to reflect that not only in the Renaissance period but in earlier periods Italy's greatest art and architecture owed much to external influence, and to wonder whether there may not exist some native genius for the assimilation of foreign influence and its adaptation to Italian conditions. In the past such influence came chiefly from eastern countries where at the relevant times art and architecture were more highly developed. This was particularly true as the Hellenistic period merged into the Roman. Rome, not Athens, became the household word among the countries of the civilised world. If much of what many people nowadays would call the "styling" was Greek the technical essence of international Roman art, architecture and technology was Roman enough to retain that name through many centuries.

The same, or something like it, happened in the early middle ages when Siena became the name most known, and again as the late middle ages merged into the Renaissance, when all Europe and parts at least of Asia knew that the word Florentine meant a new version of ancient culture only partly Italian, yet claiming like the other great Italian periods to embody values which both in themselves and as an embodiment were fit to be universally adopted. It is worth reflection, too, that the leadership in most fields of art and many of science which Italy enjoyed at the height of the Florentine Renaissance was wrested from her only when technology in northern countries pushed ahead in the industrial revolution of the 18th and 19th centuries. It was wrested from her with reluctance, for the feeling remained throughout the north

of Europe that buildings having to do with the new technology, even built by its methods, were all the better for a Florentine or a Roman facade, in which, moreover, such new techniques as the power-sawing of stone blocks and the mechanised production of sheet glass could be employed to accelerate and cheapen Italianate building, and so provide a cultured environment for the many, hitherto enjoyed only by the few.

Such reflection, it will be seen, reveals a strange but interesting and relevant parallel between what happened to Italian architecture in the past and what may be happening now. Whereas in times past the model was eastern, whether Athenian or Byzantine, now it is northern, but yet resulting after assimilation in something recognisably Italian. In a way which may not so easily occur elsewhere, the native genius being different, the new Italian architecture has a sophistication, and even a potential universality which may carry it a long way towards making the universal contribution which it made four centuries ago, even if it is too much today to say that any modern Italian house-type could make in other countries the impact made there in the Renaissance by the palazzo or the villa.

One reason for a certain retarding of progress towards Italian greatness in a century in which, on the whole, social achievement in architecture is judged more severely than architecture itself, may indeed lie in historic proximity not only to fascist but to other political and social upheavals. Italy is still close to the period of Garibaldi and Cavour. This proximity, together with that of more recent

upheavals, with their accompaniment of brainwashing in one political direction and then in another, may be the force which prevents some new and total Italian greatness from developing, a completely Italian synthesis of industrialisation and social progress from being formed into a complete and wonderful architectural and social environment. However that may be, Italian housing has had to struggle against a variety of retarding influences created by social and political conditions. One set of these is contained in the backward state of planning and housing law compared, say, with that of Scandinavia or the United Kingdom. Another, of course, is the high incidence of slums, for whether examples of slums are drawn from Naples and the depressed south or from the prosperous northern cities, Milan and Turin, nothing of the same sort exists in Aalborg or Copenhagen, Hamburg or Bremen, nor even in Glasgow (possibly the nearest parallel). Yet impressions gained in Italy in the course of the present study are of an effort at improvement, an effort indeed to achieve greatness, an effort to raise the design of housing at least to the level reached in other fields of Italian architecture, which suggests that northern standards of achievement in housing are not unchallenged; standards of space relative to climatic and social needs, standards of communal facilities, standards of integrated architectural expression.

THE FASCIST APPROACH TO LIVING SPACE.

The immediate comparison to make is perhaps with Germany as the other country within this study which experienced fascist government, though she did so after a different history of modern architecture and of politics. In Germany, as we shall see, there was little difference in the space standards set up by the Social Democratic Second Reich and those fixed by the National-Socialist Third. A combination of thrift, and a sense that the total national "lebensraum" was limited, contributed with other factors to restrict the Nazi dwelling, indoors at least, to narrow space limits. That was true even of the stadtrandsiedlungen cottages and it did not reflect either the ruling Nazi clique's ambition to breed the master race through big families in fit surroundings (the siedlungen gardens rather than the cottages) nor the grandeur with which the Nazi leadership surrounded its own daily life.

In Italy, the corresponding factors produced a different result. Apart from difficulties of expropriation[1], which exist even now under Italian law, there was no real problem of "lebensraum." Had anyone exercised the will to do it, the typical Italian town of the 1920's could have been expanded peripherally to twice its area. Except for certain towns perched on crags in the Appenines and the Alps, the process would have caused less agricultural loss in Italy than in the other countries we are considering, for land fertility, although proportional to altitude

and so decreasing with height, is not on the whole proportional to the proximity of agricultural land to the town. Soil, never very deep nor very rich except on alluvial land, is capable of production wherever it is found if labour and a water supply are available. Even close to high peaks there are little farms, giving someone a bare livelihood. These seem to exist without the governmental feather-bedding which such places need for survival in remote areas in Scotland, where it is always said that they never get enough. But their existence is like that of the West Highland croft. They also bear some resemblance to Danish smallholdings clinging to the infertile land of West Jutland. Both Scottish and Danish settlements in remote areas are suffering from depopulation and acute labour shortage, but in Italy labour has not, as in northern countries, become so much a matter of metropolitan concentration that the countryside is under-provided. And water, though everywhere scarce at certain seasons, is on the whole less plentiful where there are towns to swallow it up than it is where farms and vineyards are the chief consumers, and this is a strong factor in maintaining in full use the lebensraum of the remote areas.

Whether because of lack of effective legislation for expropriation or through inertia, the Italian town did not expand outwards in the way northern European towns expanded. Today even Rome has an urban periphery rather a suburban fringe, and the same is true of the smaller and less famous urban units. Yet under fascism there was a "lebensraum" policy of another kind. It became part of the family idea to provide dwellings in which there was space for large families to be born and to develop: "New homes where the emphasis is put on space in which

large families can be brought up, instead of on "gadgets" or "amenities" inessential to the breeding of a numerous and hardy imperial race".[2] This idea is known to have reflected the personal attitude of the fascist dictator himself. He had a profound contempt for wealth. He thought of it as a mania, a kind of disease, and behind the facade of his gaudy uniforms he lived simply; but he liked space. The Villa Torlonia in the Via Nomentana beyond Piazza di Porta Pia, lent him as a town house in Rome by the banker Prince Giovanni Torlonia, is a large, cool, spacious dwelling behind the deep ochre walls which dignify so much of Rome. Mussolini admired its dignity, liked its spaciousness and enjoyed living in it, even if he preferred his feudal castle Rocca delle Caminate. When as a political prisoner he was kept for a time in an isolated, greyish, sad-looking little house on the island of Ponza, his reactions to its lack of space were sharp and immediate. So was his anger when the tap of his wash-basin did not work: "I spent a pretty penny getting pipes laid in Ponza".[3] While dictator of Italy his speeches, frequently referring to housing, laid emphasis on living space, and he had always been impressed with spacious buildings rather than with their contents. "What a lot of rooms" he said on a visit to the Vatican, "and how big they are. They knew how to build then", ignoring the tapestries and other works of art surrounding him on all sides.[4]

The concept of generous space found more visible application in the grandiose schemes of public works Mussolini instituted.

"Bridges, canals and roads were built; hospitals, housing and schools, railway stations and orphanages", says a biographer, dramatising the heterogenous nature of the range of undertakings; then pointing to their general failure: "Work was begun but often left unfinished . . . . . while behind the facade of well-advertised schemes of modernisation and welfare services, half-a-million people were still existing in conditions of pitiable squalor".[5] Half-a-million sounds dramatic but in fact must be a careless understatement: statistical material quoted later in this chapter of this thesis suggests that there must still be as many in Naples alone.

TRADITIONAL SPACE STANDARDS.

Whether or not they had been applied at all to make standards for modern housing in Italy, Italian Renaissance achievements already meant much to the design of middle-class housing in northern Europe in the 18th and 19th centuries. Where else did those standards come from which decreed that suburban villas in Edinburgh had to have ceilings 11 feet high, and dining-rooms and withdrawing rooms measuring 18 feet by 22? But they meant less to Italy herself, for there a lagging economy and the absence of any form of industrialisation of building meant that such space could be afforded only for a privileged few. It is true that these few became more numerous in the industrial

towns of the Italian north in the 19th century, where a new bourgeoisie even inherited the palazzo tradition. Writing of life in Bologna in 1914 Freya Stark says: "the people"(she is describing the twice-a-week bourgeois audience at the opera)"were rich, hospitable and gay. They lived in beautiful palaces, built round inner arcaded courtyards of their own, decorated with Renaissance delicacy and splendour".[6] But at the same time aristocratic occupancy was declining and the same writer describes a less spectacular if more authentic version of the palazzo, on the occasion of visiting Dronero, a small town high in the Alpes Martimes, in 1917. "An ancient noble family . . . . . owned a sunless palazzo tucked among back streets . . . . . with a few treasures of furniture and pictures, and family trophies . . . . among chairs upholstered in red damask hard as tennis balls, antimacassers, woolwork footstools, cushions with sporting dogs embroidered on them, and royal photographs with flourishing signatures in crowned silver frames. It was a real old Piedmontese family untouched by any outside influence at all, something belonging to an age before 1789".[7] Again another picture of the palazzo is that of its present occupancy by the rich and favoured in Italy of the 1960's, such as the 17th century palazzo at Spoleto in Umbria owned and occupied by Gian Carlo Menotti, the composer. He took it in 1958 for his first Festival of Two Worlds, which, eight festivals later, has in 1965 become part of one Italian way of life. "I am regularly faced", he declares, "by an avalanche of princes, princesses, dukes

and duchesses, who swarm over my house in their wonderful clothes eating, drinking, and cooking spaghetti in my kitchen." A visitor more to his taste was Ezra Pound, who was so charmed by his ovation at Spoleto that he refused to go home. "He moved into my palace, walks around town all day . . . . . and has nearly supplanted me as King of Spoleto."[8] For this kind of renewed existence, the old building is expensively renovated, with modern kitchen and bathrooms, and year by year more and more of them, usually the smaller ones in the smaller towns off the main tourist routes, are revived as dwellings in this way. But the palazzo was never in any sense a typical dwelling, even in its humbler versions, as at Dronero; or in its bourgeois occupancy, as at Bologna; still less in the hands of the modern upper class, as at Spoleto. The villa has also remained out of the common reach in a way which has not occurred in the northern countries. Where is the Italian version of the Scottish bungalow, or the Danish typehus? We may be glad to say there is none, but is this more than admitting that Italians have been so mesmerised by the grandeur of the older villa types that any modern adaptation is made more difficult in Italy than it is in less inhibited countries? At any rate, the Villa Torlonia interlude, with Mussolini leading his own version of the bourgeois life, did not help to create a new Italian norm for frugal adaptation of the generous past.

Palazzo and villa alike have always contrasted with the tiny flatted dwelling - a pocket of rooms in a wall of buildings - which for

centuries has been the home of the vast majority of town-dwelling Italians. Unless industrialised techniques can now produce other kinds of dwelling on a new scale and in vast quantities, it seems that this must continue to be their typical home for yet more years: this or its modern adaptation, the flat or the maisonette in a tower block or a slab.

One such tiny dwelling at Genazzano in the Sabine Hills, east of Rome, is illustrated with the case study material. In modern language it is a maisonette, for it consists of the two lower floors of a four-floor building, the upper floors of which form a similar dwelling reached from a street behind, running at a higher level. In a vaulted cellar nearby are stables where donkeys and mules used in surrounding agriculture are kept, for the terrain itself restricts agricultural mechanisation.

The simple economy of such a dwelling centres in a living room where cooking is by means of built-in hearths of stone, and the other functions by rush-bottomed chairs and two plain wooden tables. Furniture of this kind is still made in small workshops and some of it, on sale on the sidewalk in Taras near Taranto, is illustrated. Food in such a dwelling is stored on stone shelves in wall recesses, clothes in a coffer, and fuel in the cellar-like back room behind a screen. At the head of a stair of easy going without winding steps are two bedrooms, the inner one lit only from the outer, through a door and two peepholes.

These seem very spartan arrangements, but it has to be remembered that the people spend much of their time out of doors. The women take their chairs into the street and sit there sewing or sometimes knitting, though knitted garments are less used than in more northern lands. They sit there surrounded by playing children, and when the men of Genazzano, mostly agricultural workers, have had their meal at sundown after a day's work in the fields, vineyards or olive groves, they spend their evening in talk and various gambling games in cafes and in the open air on the little piazzas formed at street intersections. Those who work in the town spend part at least of their siesta in this way, as shown in an illustration from Ferentillo in Umbria, a town not unlike Genazzano. Space nevertheless is very restricted and it is obvious that, in the present age, something better must supervene. There is the question, too, of sanitation. The writer did not discover whether human waste was accommodated or dealt with inside this dwelling at Genazzano, but suspects that most of the town's inhabitants adopt the custom of dealing with its more serious form by going outside the walls in the early morning and squatting there among the rocks, men, women and children doing this together without embarrassment, fifteen to twenty of them at a time. This was not observed at Genazzano, but at Castel Sardo, a hill town in Sardinia, the time being 5 a.m., the northerly slope away from the sun being chosen, presumably to reduce unpleasantness.

If the space standards and civilised habits of palazzo and villa are not for the inhabitants of the tiny dwellings which line street and piazza in Genazzano, Ferentillo and the rest, what are the appropriate standards for improvement, or for re-development? What, it might be asked first, do the inhabitants themselves want? What, again, are their observable basic needs, whether they express these or not?

It can be said, though to do so is to make a sweeping statement, that life in such a town, with its 5,000 inhabitants or so, all of it by the modern housing standards of Italy or any country a slum, belongs to a past age.[9] But interviews with inhabitants of this and other similar places conducted in the course of the present study do not entirely confirm that. They suggest that there is a certain contentment with the age-old status quo. They also suggest that this is a state of mind in maintaining which the conservative wing of the Church still dominates much Italian family life, particularly the use made of leisure hours, whether we are speaking of life in town, village or on a farm, and that only underneath can be felt the current towards rapid and radical material progress. Where it is felt, this undercurrent has its objectives in metropolitan life rather than in urban life. Rome and Milan are the ideals, or contain the ideals unless it is places even further off that contain them such as New York or Los Angeles. The cause is simple. The common social nucleus in Italy is the town or the little city, like Genazzano,

Ferentillo, Taras and Spoleto. Outwardly it is a contented place, with its firmly patterned way of life. Inwardly, it is unsure and, in a strange way, frustrated and even hopeless, for all that tourists, including socially-conscious ones, see values there which the inhabitants do not see in the same way. It is the common social nucleus because the nucleated Italian population amounts to 76% of the whole, according to the 1951 census, and with agriculture widely served by such little cities or towns, the vital distinction in Italy is less that of urban and rural character than it is of metropolitan and non-metropolitan. The same census showed only 25 communes in all Italy with more than 100,000 inhabitants, and at the top of the list a sharp decline after Rome, Milan, Turin, and Naples, all over the million-mark, to the 390,832 of Florence in the 7th place and again to Verona, in 13th, at 186,555.

Partly because of this kind of distinction between kinds of community, there exists very little idea in the Italian mind how to improve places like Genazzano and Spoleto. The well-to-do can convert a mouldering palazzo into a modern dwelling of no metropolitan kind, but what are ordinary people to do with their much less maleable dwelling units, which they do not even own?

Whether it is because of a conservative or supine attitude all round, or frustration because owners cannot be made to move, progress in improving living accommodation in a town like Genazzano begins with the acquisition of gadgetry rather than with the creation of

new accommodation or the real improvement of old. First the donkeys are exchanged for autocycles and jeeps. The stone niches are supplemented with a refrigerator. The neighbourly entertainment of the street is assisted by the acquisition of radio and T. V. Gadgetry does not provide for sanitary needs, however. The chemical closet which might accomplish much seems not to be resorted to; instead there is the morning journey outside the walls or else the "Tazza" (lit. cup) in a corner behind a curtain. Nor is gadgetry a substitute for space and for those who instal it what is the next step but to seek more space for more gadgetry? This spiral of development, familiar in other countries studied, is not inactive in Italy, even in towns where conditions seem irremediably static, and from young housewives struggling with modern household goods in restricted space, the word "impacciata" (cramped or encumbered, or jammed) was heard in complaint.

THE ITALIAN METROPOLITAN SLUM.

The writer's own investigation of conditions was necessarily only by random sample, but some of Italy's slumland is covered by house-to-house investigations and these reveal a situation in which both space standards and sanitation are at an unendurably low level,

however indoor space and that out of doors are in actual space-use integrated. One such is a study of the Potenza quarter of Naples presented at the Fifth "Urbanistica" Congress of Italy at Florence in November 1955 by Professor Corrado Beguinot of the University of Naples.[10] This quarter consists of 19th century flatted blocks lining narrow streets lit also from narrow courtyards behind, typical of a kind of development familiar in Italian cities which expanded in population during that century. The architectural derivation is the high-density flatted dwelling-house of earlier times like that examined at Genazzano, but without the social advantages and certain of the architectural ones seen in that kind of community. The main facts of his survey Beguinot summarises in a table of which the following is a translation.

Summary of Data for the Potenza Quarter, Naples.

Households visited	425	
Dwellings visited	425	
Inhabitants	1917	
Number of Rooms	803	
Average size of family	4.5	
Index of overcrowding	24	
Dwellings without running water	170	(40%)
Dwellings with sewerage but without running water	322	(75%)
Number of basement-dwellings	93	(22½%)
Number of basement-dwellers	388	(20%)
Average number of persons per basement-dwelling	4.2	
Number of ground-floor dwellings	204	(48%)
Number of ground-floor dwellers	622	(33%)
Average number of persons per ground floor dwelling	3.25	

Number of dwellings with	13	persons	1
	12		0
	11		0
	10		1 (0.2%)
	9		4 (0.8%)
	8		9 (2%)
	7		19 (4%)
	6		26 (6%)
	5		42 (10%)
	4		57 (14%)
	3		65 (16%)
	2		97 (24%)
	1		70 (17%)
	1		25 (6%)
Number of single-room dwellings			217 (53%)
2-room			96 (23%)
3-room			42 (10%)
4-room			27 (7%)
5-room			9 (3%)
6-room			10 (4%)
Dwellings of convenient type			3 (2%)
improvable type			148 (35%)
unhealthy type			56 (13%)
very unhealthy type			218 (50%)
Families of normal type			187 (45%)
Families possible to educate			227 (52%)
Families of abnormal type			13 (3%)
Dwellings of convenient type occupied by normal families			3 (0.1%)
Dwellings of convenient type occupied by families possible to educate			0
Dwellings of convenient type occupied by abnormal families			0
Improvable dwellings occupied by normal families			120 (28%)
Improvable dwellings occupied by families possible to educate			35 (8.3%)
Improvable dwellings occupied by abnormal families			1 (0.20%)

Unhealthy dwellings occupied by normal families	60 (14%)
Unhealthy dwellings occupied by families possible to educate	140 (32.4%)
Unhealthy dwellings occupied by abnormal families	9 (2.1%)
Very unhealthy dwellings occupied by normal families	6 (1.4%)
Very unhealthy dwellings occupied by families possible to educate	53 (12.2%)
Very unhealthy dwellings occupied by abnormal families	3 (0.7%)

Beguinot does not define his terms, improvable, unhealthy, normal or abnormal. But we are led to assume that a very unhealthy dwelling (molto malsano) is a damp, dark single-room dwelling in a basement or at the back of a street-corner, without running water or sanitation and with space too restricted to contain any hope of re-arrangement. Likewise, a famiglia anormale is one entirely unable to control its environment, both in the sense of being too poor to do so and in the sense of not having the will.

It is hard to select the most horrifying facts from such a table. That running water is lacking in nearly half the dwellings sounds all the worse when the report adds that the families concerned have to fetch water from a public fountain at 20 minutes' walking distance. The presence of sewerage without running water, the situation in 75% of the dwellings, often means, says the report, that the latrine is only a hole in the floor of the threshold

of the entrance to the dwelling, with a stone cover and no privacy, not much better than the "tazza" arrangement. Yet it is the least that could be endured in circumstances where retirement to some convenient outdoor space to satisfy the needs of nature is impossible, made so by the very metropolitan situation which in other ways is so natural to Neapolitans, so attractive to the many immigrants who still flock thither.

Taken together, the percentages about sanitation present a terrible picture of squalor. The report does not relate the percentages to each other. We are not told how nearly the 55% of single-room dwellings coincide with the 50% of multo malsano dwellings or with the two sanitation percentages, 40% and 75%. But plainly there is some general coincidence between lack of space and lack of sanitation and the picture presented is one of space under-provided and, partly as a consequence, poorly used, for there are 300 rooms and with different arrangements these could have housed, say, 200 families quite well. It should be noted here that Italian housing surveys, by taking notice of the kinds of family found in possession, normale, educabile, abnormale, allow for the possibility that tenants themselves might help towards improvement, as they do in communities like Genazzano, where, after all, the houses stand within a rudimentary but properly conceived town plan. In fact Genazzano has a culture: the Potenza quarter in Naples has none. Had Neapolitan town planning of the 19th century been better, things

would have been different and the only really hopeless situation revealed in the Potenza quarter might have been the "very unhealthy" dwellings tenanted by "abnormal" families. As things are, the pervading quality is a hopeless squalor, of a kind which Freya Stark dramatises in a few words worth adding here at the risk of overworking a source. It concerns conditions she as a nurse was trying to alleviate, not in Naples but Turin, during the influenza epidemic of 1917, the city overcrowded with refugees from the Austrian advance after Caporetto. "Four people lay in a room, one dead, one terribly sick, the child in the same bed, and a wife beside them in a miasma of stench and flies."[11] She also describes an aspect of the situation more typical of that period than the present, yet probably not unknown today; "I was up against the fact that the municipal doctor took no interest in patients who did not pay. The man was sinking and speechless and a soporific had been prescribed. I hurried to find the doctor to make him revise his prescription. He was furious with me, furious that I should see the way in which these people were left to die".[12]

A picture of greater width but similar content with a more everyday air is given by the Australian observer, Morris West, whose interest in Italian social conditions was aroused by his wartime experiences of 1943-45 and who made his own study of Neapolitan slum life in 1948. He "peers into tiny rooms where

women with pinched faces bend over knitting or sewing, or where families of ten or twelve chatter and gesticulate over bowls containing only pasta." He walks down alleys "paved with rough stone blocks slippery with mud and foul with slops from the tenements. Refuse was piled in heaps outside the doors and in the reeking angles behind arches." Across an alley were three doorways. "They were open in spite of the cold and yellow bulbs were burning so that we could see inside the rooms. The first was a small cobbler's shop where a man and his two sons were working over their lasts while a woman with a blonde girl on her lap sat talking to them. Behind was a smaller room with a brass bedstead and a votive lamp burning before a plaster Madonna. The next door opened into a dwelling. There was a very old woman, grey, gap-toothed and shapeless under a huddle of shawls, a middle-aged couple and six children, boys and girls, whose ages ranged from about five to eighteen. Nine people in all! They sat round a table eating the evening meal. The rest of the room was cluttered with a huge matrimonial bed, a sideboard and a large wardrobe with a tiny Agipigas stove over which was hung an array of cooking vessels. The third door opened into a narrow room with two single beds and a tiny table at which a mother and three teenage daughters were working on what looked like a wedding gown of white net. They had the grey pinched look of people who work too long and eat too little and see too little sunlight." But these "are the

lucky ones. They have work to do and a house to live in".

The nine people were all to sleep in the bed: "it is big, you see . . . . . the old, the young men and women, the married, the unmarried . . . ".[13] How like all this is to the Glasgow of the 1930's and 1940's, to Dr. Bradbury's survey of it.

The report on the Potenza quarter states that there is virtually no domestic electricity in the whole area, but this is perhaps less shocking than the sanitary and space conditions, for the olive-oil lamp is still a well-liked and cheap form of lighting. A particularly effective form of lamp with reservoir and wick on a stand which can be brought close to the work in hand, sewing or writing, has been in use for some centuries. It is depicted with the case study material in a reproduction of a painting of Rémy Cogghe, the Belgian artist, done by a fellow-artist in Rome in 1883, which in a general way also depicts the inside of a small Italian living room of that date where some care in furnishing had been taken, on a basis of some modest financial resources, and some initiative. It also appears in a more sumptuous version in the painting by J.S. Sargent which illustrates the palazzo in modern use.

HOUSING BEFORE WORLD WAR II.

Genazzano and Neapolitan conditions described are those

existing today, and are representative of something still widely prevalent. In the earlier decades of this century they were omnipresent, and were part of the material out of which syndicalists, like Mussolini in his youth, and nationalists, such as Corradini, built up their case that Italy, in her poverty, was a proletarian among the nations, only able to win justice by asserting her power in the face of the world. In this way a movement for social betterment became a war programme, defeating itself and its objectives.

Yet there had been great efforts to improve conditions. As early as 1908, three years before Mussolini began to denounce the parliamentary state in his newspaper Avanti, the first housing legislation was passed by the parliament he despised. Its purpose was to finance through the State Bank the "Instituti Autonomi per le Case Populari" (Autonomous Institutes for Peoples' Dwellings). These, shortened in name to IACP, were the outcome of a long political argument in which others than Mussolini had taken part. But his denunciations, even if they only came later, were on the mark, for it must be admitted that the main pressure for a housing organisation had come from the communes and not from central government. The first instituto was established in Rome in advance of legislation in 1903 by the City Council with no outside support. Yet there was an advantage in that situation, for the instituti, reflecting this important fact about their origin, became independent of the civil service, although they were recognised as public bodies and given borrowing rights and other privileges.

Little action followed, although the concentration of war workers in Milan and Turin from 1913 onwards created not only an acute housing shortage there but a wonderful opportunity for the new instituti. It was an opportunity not unlike that of Rosyth at precisely the same time in Scotland, and out of it Turin or Milan might have had its new modern developments of war-workers' houses. Nothing happened there of that kind. But the instituti had not been idle. They had begun to plan their future production ready for the rush of building projects which came in the wake of the armistice of 1918 and the peace of 1919. Since much of that rush was in the hands of speculators, it is particularly important to reflect on the wisdom of the 1908 Act, which laid down for the instituti a co-operative basis, something quite untried in Italy. It was on this basis that post-war programmes of instituti housing went ahead. By adopting at the outset a co-operative basis for Italian social housing, says Professor Ludovici Quaroni, the instituti planted the seeds for a highly positive development of Italian housing policy later to mature.[14]

Freya Stark describes how, without organised co-operation, the more independently minded of Italians, and others living in Italy, could manage at this period to create dwellings for themselves, out of nearly nothing. In 1919 she acquires a four-roomed cottage at L'Arma, on the slopes of the Alpes Maritimes, close to the Italian-French border at Grimaldi, overlooking the Mediterranean. With its two-and-a-half acres of land, it belongs to five

people, who cannot agree what to do with it, for it has been in German occupation and has just been vacated by the retreating German-Austrian army. But with the purchase negotiation in the hands of the local innkeeper, Claudia, it is bought simultaneously from four of them for a song. The fifth held out, and later claimed a larger sum.

"It was a poor little place, but it seemed Paradise to me. We spent months down there and worked like slaves at painting and arranging. The four rooms made bedrooms, and a front hall, quite tiny, was our only salon till we could add two large rooms to complete the whole. We went out down a slope of the vineyard to kitchen and dining-room. I designed wardrobes to reach the ceiling with a shelf-cupboard on top for stores, and my mother painted them - one room to represent each of the seasons. The land was all neglected and one of the chief expenses was a windmill to draw water from the well . . . . The villagers were . . . . pleasant. They saw us working and were far nicer than they ever were to the rich people about them; they would come and help in their free time in the evening and tell me what to do about vines and orange trees and manures." [15]

The operative forces were two. First, an assured income of ninety pounds a year for two people, nothing at that time in England, but in Italy the annual wage of a better-paid artisan; and the gumption needed to defeat the stifling effect of Italian laws of

inheritance. Many an Italian family at this period, in desperate need of new quarters, had the one, but few had both. Herein lay a stagnation of effort which, in particular, robbed the countryside of some chance of keeping its properties and its production in a true profit-and-loss relationship with the investment activities, most of them on a bigger scale, of the cities.

Axel Munthe, another foreigner setting up house in Italy at this time, tells (in 1929) a similar story, in his case armed with more money, a higher social position, and a more fashionable location, on the island of Capri.[16]

No doubt much of the same kind of individual effort was expended in the cities, but there the authorities had a heavier hand, whether used to promote or to prevent development. The instituti, at least, worked on the positive side. By the end of 1922, when Fascism took over, Milan with a population of 600,000 had managed to build 4,370 new dwellings through its instituto and Turin with 400,000 had built 3,390. But the showpiece was in Rome: the garden city of Garbatella begun in 1920 as a mixture of flatted blocks and villa types, equipped with a range of welfare institutions. Garbatella, an unfinished conception, has a distinct relationship with Rosyth. Each is, in a sense, an unwilling garden city, an example of an idea fetched from abroad and having to be adapted to local circumstances. Each is near its capital city, in neither of which were to be found the worst housing conditions of

their respective countries. Each would have achieved so much more, it might seem, had the one been a Naples or Milan satellite, the other a satellite to Glasgow. Urgency would then have driven them on.

Whether judged at Garbatella or elsewhere the earliest achievement of the instituti in terms of space-provision was a matter of house-and-street relationship. The habit of building continuous lines of tall flatted blocks on narrow streets lit behind by occasional courtyards was to stop. Instead the four-square block with central staircase separated by "broad avenues and green spaces . . . partly laid out as gardens and partly destined for vegetable cultivation",[17] was to be promoted. In 1924 a second organisation of instituti was added having the initials INCIS, with the function of housing State employees.

Space standards imposed, or perhaps more accurately, sought by the instituti, whether IACP or INCIS, varied from city to city, and within cities, coming to rest at levels of provision which form three categories:

a) minimum dwellings for the casually employed very poor, accepting the single-room dwelling, but providing for it sanitation and cooking facilities.

b) a common type of two or three rooms, with lavatory and kitchen, for letting at moderate rent to artisans in regular employment.

c) a superior type, with up to four rooms, often with bathroom, intended for middle class occupation, later to become the tenant's property.

It was within the first of these categories that the famous "hotels" of the 1930's for the very poor were evolved, with examples in Rome, Milan, Florence and Venice, with their one-room flats sharing common dining rooms, kitchens and other facilities. The dining rooms were not a success, but in the kitchens, provided on a scale of one to eleven families, each family having their two charcoal stoves marked with their room number, tenants in some way found themselves able to work side by side. W.C.'s in these hotels (still of the hole-in-the-floor kind though now made of vitreous china) were on the scale of two to every fifteen rooms, with two hand basins with cold water. Baths and showers were provided at a charge and furniture available on loan. Finally each hotel was equipped with a creche where children could be left while mother went out to work, and a communal cold-water laundry.

These hotels seem to have the distinction of being the minimum European family dwelling of modern times of considered standard, for in such emergency arrangements as the refugee barracks after World War II, where in some respects life was similar, the standards set were more accidental and cannot be

compared. Northern Europe produced nothing quite like these Italian hotels, although in not a few cities - Glasgow and Hamburg for instance -it might well have been possible to demonstrate a need for such in that same inter-war period.

For all three categories of dwelling, apart from the hotels, which were in their way a special case, the minimum standard accepted by the instituti was that each dwelling must have a separate W.C. and water supply and that each room had to contain 8 square metres of floor space per occupant, or 86 sq. ft. This is better than the Scottish standard of DHS circular 76 of 1935 which allowed two people to sleep in a room of 110 sq. ft., and in effect allowed that to happen too in a room of 90 sq. ft. Ceiling heights in this Italian housing were close to 9 ft., equalling the highest local authority ceiling heights in Scotland, while the rest of Europe was being content with considerably less. Thus, Italian housing of the Mussolini period takes its stand as, in theory, the most spacious.

To this period belong the dwellings in Milan illustrated with the case study material under the heading "Typical dwelling of the 1930's", and generally conforming to the standards quoted. These illustrate the aim to spend money first on size of rooms. There is virtually no storage, for there was nothing to store. The kitchen contains only a sink, where personal ablutions and clothes-washing take place besides kitchen operations, all in cold water.

Even the entrance-hall is relatively large and may contain the heating stove, so that in cold weather the doors of rooms are left open to the hall which then warms the whole dwelling.

Floors are tiled throughout and sinks, which are of vitreous china, the sink and the draining board cast in one piece, have tiled surrounds. Gas and electric light are brought to the wall surface of each flat, but equipment and fittings are left to the tenant. Coal, charcoal and wood-burning stoves are still common in this type of dwelling, such fuel being cheaper than gas. So, until recently, were the oil lamps just described, for they were often preferred to using the much more expensive electricity. Gas was generally fed to a ring but not to an oven, for which coke or charcoal was not only cheaper but to a good cook preferred. Basic decoration of colour-wash is provided for the tenant but he takes over thereafter, still occasionally using traditional Italian skill to apply exotic colouring in a folk-tradition version of Baroque to the firmly traditional construction of plaster-on-the-hard. Solid floors and lack of cavities behind plaster, besides giving a lasting quality to Italian housing, have greatly helped in old buildings and in new to prevent the verminous conditions which have been such a nuisance in Scotland.

Baths were uncommon at this period in flats as small as that illustrated, but each block was equipped with a group of baths and showers on a scale of four of each to every fifty

dwellings.

One bath a month was provided free: any more cost money and, it seems, have not generally been much in demand.

In other dwellings of this period which were inspected in the course of this study, the kitchen was noticed to have a cement bench with a gas point and a ventilating hood. It was generally observed that there was no larder, and little habit of storing food in the house, an observation corroborated by noticing how small were the daily purchases being made by Italian housewives in food-shops.[18]

The private balcony appears in Italian housing of the *instituti* period about 1935, generally in the form of a recess into the building, as in one of the examples shown. Its most general use then and now is for the airing of bedding, for drying washing, and for storage.

In a number of blocks communal laundries were introduced, generally in a basement. Equipment was of the most primitive; only cold water was supplied, and old-fashioned flat-irons brought along by tenants were heated at a stove provided for this purpose, while the space arrangement included a play-pen for children to occupy while mother laundered.

All this might have been very ideal, on a certain primitive level, had not the whole bold idea come completely to grief on the failure to build enough houses. This was partly a matter of an

under-equipped building industry and partly a matter of economic troubles, and partly because the situation between co-operative and speculative housing had not been resolved. The one feared the effects of housing shortage while the other thrived on them. Overcrowding took charge and hordes of people went to live in houses planned carefully for ideal occupancy. The prevailing overcrowding of all Italian housing merely spread to the new blocks. From the 1931 census, it seems that at that time Italy lacked seven-and-a-half million dwellings from the figure required to arrive at a degree of occupancy of one dwelling per family. Here the space standard is not of the optimistic kind exemplified by the instituti housing, but a sober reality in which, recognising the facts about likely occupancy, thoughts run to the other extreme. The space standard made the basis for the census prediction comes down to something near the lowest endurable European level for family existence. It provided for a dwelling, or the equivalent of a dwelling, of one room plus kitchen and bathroom, totalling 36 square metres or 172 square feet, no matter what was the family size. This came curiously close to the minimum standards of the Glasgow Police Act of 1862, altogether a different comparison.

Instituti housing was also hampered by an awareness that, while overcrowding existed widely, so did undercrowding, and flats built too generously could not be occupied unless it was by

more than one family, because one family could not afford the rent. The 1931 census showed that 6% of all Italian dwellings stood empty for this reason. That happened, of course, mainly in middle-class districts, but there were great numbers of people of more than one class whom the economic situation left without the means or the inclination to occupy larger or better accommodation than they presently occupied. 1931 was the year when economic depression was worst. Nevertheless its census can be taken as an indication that the problem of space in dwellings could not be resolved only on the technical and constructional level, but needed to be taken up for solution on the economic, financial and social levels, all on three assumptions: first that in any country a modern house is not a luxury but a necessity: secondly that the Italian economy could supply it for everyone, at a personally economic rent even for the poor: thirdly that the ordinary Italian family, given its opportunity in those terms, would agree to the limited extra spending which would be needed to move to its new quarters without thoughts of sharing them.

Unfortunately reliable figures are not available in this kind of detail for years nearer the outbreak of war, by which time it had become politically important to stress achievements and distract attention from failures.[19] Figures of housing production probably reliable are, however, available by cities for the year 1937 in terms of the census standard and an overall figure for 1938 - the peak pre-war year for number of buildings completed - is only two hundred

thousand dwelling units, at which rate it would have taken 37 years to reach the target set by the census. Production was concentrated in the big cities where the instituti operated. By 1937 Milan, now swollen to a population of 1,650,000, had built since 1920 through its instituti, 18,399 dwellings, though it needed to build four times that; the other metropolitan areas had reached similarly modest levels of achievement.

It was an additional indictment against Italian housing practice of the decades before World War II that, while the metropolitan areas showed some production, there was little or no new housing in the lesser urban areas. The rural areas were similarly neglected, although improvements which might have become general were demonstrated in the work done on the new agricultural land re-claimed from the Pontine marshes in the 1930's, particularly in the new market townships of Pontina, Sabaudia, Littoria and Aprilia. These achievements were well publicised, but otherwise housing reports of the Fascist era seem to concentrate on Rome, Milan, Genoa and Turin.[20] Genazzano and hundreds of like places do not enter the official scene. Apart from local attitudes, whatever they may have been, this was, of course, a serious piece of governmental neglect, and because of it Italy entered World War II in no state to endure what in fact resulted: five years in which much of the progress made in the cities by the instituti in overhauling a growing backlog of work during two pre-war decades was lost, even before war damage comes to be considered.

At the end of the second world war Italy was in a condition from which it seemed impossible that she could extricate herself. The damage caused to industrial installations, to farming, to roads and railways, to dwellings, was immense. Seven thousand kilometers of roads, twenty-eight thousand kilometers of railway track, thirteen thousand bridges, two million eight hundred thousand dwellings were destroyed or seriously damaged. The general impoverishment of the country was even more serious because of the four million square kilometers of agricultural land made temporarily uncultivable. Damage caused to dwellings, it should be added, was reckoned, as in the 1931 census, by units of one habitable room plus kitchen and bathroom of equal area and presented as one million eight hundred thousand units destroyed; one million seriously damaged; three million eight hundred thousand damaged.[21]

HOUSING AFTER WORLD WAR II.

(1) The Modern Renaissance of Italian Architecture.

War devastation meant more to Italians than the destruction of their homes. It signified the collapse of a national attitude and on all sides were heard the murmurs of heart-searching discussion. There was political discussion everywhere, particularly and significantly

amongst ex-partizans and others who had formed the active resistance against the fascist dictatorship in its last years and against the German army and S. S. There was religious discussion, as the liturgical movement, hitherto submerged in Italy, broke surface and began to demand reforms of the church. This was of no little significance to Italian post-war housing, for it brought about a participation by the church in the erection of important new ecclesiastical and social buildings, all wearing their new liturgical look. They were sited at the various centres where shopping, schools, laundries, etc., were soon to be grouped, as neighbourhood planning came into vogue.

Ranging over the whole field of possibility about the new Italian environment, there was architectural discussion. It kept close to political discussion, for Italian architects had known how thin the ice had often become as they skated round the problems of putting up buildings under the control of the Mussolini government. But it is not true to say that the architectural re-birth of Italy after World War II was exclusively the product of political trends. There had been a lot of skating on the political ice, for all through the Fascist period there were enough rebels against political conformism to keep architectural development moving. Fascism lacked entirely a political programme except a determination to rule, and although it adopted the cultural idea of reviving the sights and scenes, even the panoply, of the Roman empire, that was not a cultural programme.

It did not compare with the German Nazi programme of romantic expression of a nationalism which proved much less remote. And it was admitted that the new Roman empire must wear a 20th century dress. Thus the position developed in which the regime could accept or reject each architectural trend according to the enterprise and shrewdness - or lack of these - found in the person who suggested it.[22] While Del Debbio's neo-Roman architecture was taking shape at Mussolini's Stadium, in an extreme of pseudo-imperialism, Rome acquired other buildings, such as the Fencing Academy, accepting the standards of a new architecture which fascism, unlike nazism, had no clear logical reason to denounce. Again, in contrast to the many backward-looking and formalistic fascist headquarters buildings spread throughout the land, Giuseppe Terragni designed and built at Como a party headquarters building which because of its gracious composition yet essentially functional design, stands in the front rank of European architecture in the 1930's. Further, in the sphere of civic design, the resounding architectural failure of the Via del Rinascimento in Rome was offset by the new railway station in Florence boldly selecting the pure lines of modern international rationalism for a structure sited on a piazza right in the heart of Italy's most famous historic milieu. That kind of thing could not have happened in Germany.

On the other hand, such dualism was not peculiar to Italy. In the same years Denmark built Aage Rafn's neo-classical Politigaarden

besides Arne Jacobsen's Bellavista and Vilhelm Lauritzen's Radiohus. In the same years Scotland clung to an official architecture largely in opposition to the modern movement though it had little to do with academism of any sort, as evidenced by Sir Thomas Tait's St. Andrew's House in Edinburgh, headquarters of Scotland's central housing authority, thought at the time to be a modern building. It might be concluded that in Italy it was not wholly an illusion to think that fascism could bring freedom from tradition, from plagiarism and from outworn academic culture. But if this did occur it was essentially due to men who knew how to get their ideas accepted and this was true already at the beginning of the twentieth century. While Charles Rennie Mackintosh was doing battle in Glasgow for new architectural standards, including standards to be reached in the design of houses, Italy produced Raimondo d'Aronco and Ernesto Basile, able to depart from the academic culture of the time by designing original forms and to get their ideas accepted, if not widely then decisively. In 1914 Antonio Sant'Elia, self-styled "Futurist", published his manifesto of a new architecture, and became forerunner of something which is part of modern international architecture in a way only in later years becoming understood. When he was killed in World War I, Italy lost an original mind which might have prevented the lapse of ten years before the next renewal of ideas. This was the establishment of Rationalism by the so called "Group 7",

dominated by Milanese antipathy to "Roman" architecture and imbued with a desire to achieve a modern architecture outside the range of official Government policy, which by now exerted a strong influence on every building activity, imposing dreariness unless something very positive was done instead. Roman architects too felt the need to develop along rationalist lines and formed with their Milanese colleagues the Movimento Italiano dell' Architettura Razionalista (MIAR) aiming at an architectural rebirth, understood not only on an aesthetic level but also as a new architecture emerging through a review of social needs. The spirit of this movement is well expressed in the design of Peressutti's Casa Ideale of 1942.

Official Italian architecture on the other hand continued to clothe itself in neo-classic garb even after the end of the war, despite the upsurge of rationalism. One reason was that for too long architects had discussed purely aesthetic problems which although having their value, did not focus interest on one problem now seen to be all-important: the right of every man to a well designed home. The need for architects to educate and listen to public opinion about this and to encourage its intervention in government policy was felt on many sides, and well expressed at the National Congress of Reconstruction held at Milan in 1945. There Bruno Zevi said, much in tune with the spirit of the time: "We must examine all the senseless deeds of our life; we must build a new house, a better town, a fit dwelling for man". With less clarity but refreshing pungency Irenio Diotallevi added: "Homes are goods

which we must give to mankind even at public expense just as we send quinine gratuitously to areas afflicted with malaria". Ernesto Rogers brought out a point as relevant outside Italy as within:

"Urgent reconstruction must not prejudice for any reason whatsoever the permanent result. A badly set leg means a leg injured for ever". Ortensio Gatti said: "We must not only reconstruct houses destroyed and damaged but also repair deficiencies quantitative and qualitative existing before the war. We need a well planned reconstruction programme, which gives priority to inexpensive working class housing and schools before luxury dwellings and churches. Every Italian family must have a dignified and healthy home and have it soon".[23]

In words, at least, Italian architects were ready and contributing, but it took time to bring about their full participation and to show that the new Italian architecture was ripe to take over Italian housing, and make it part of a new great architecture.

A seriously retarding factor was that there was no generally acceptable basis for the design of housing layouts, unless it was to be found at Garbatella, but that was seen to be as outdated as Port Sunlight. Sabaudia, with its central piazza, was looked upon with some affection, but to those who knew, it represented a lesser achievement than Radburn and Greenbelt, not to mention the ideas for new towns produced in England by Trystan Edwards or Dr. Thomas Sharp, and well behind the material published in the London

planning reports. For this reason, but also because the town planning into which architects were now elbowing their way had long been the preserve of highway engineers and surveyors, good architectural layout in Italian housing has been long in coming. Layouts such as Tuscolano (see the relevant case study) with their principles of traffic segregation, partial at least, and their sense of a need for harmonious grouping of buildings of different height and shape to form one comprehensive urban group, do not evolve at once after 1946. The difficulty has been, of course, the extreme difference between the layouts composed of separated blocks which, from Garbatella, characterised the inter-war housing and the characteristically continuous townscape of the older towns. It is a matter both of continuity and interruptions, because the lack of the traditional piazza in the new layouts is a source of monotony in them. They need its interruption.

Perhaps this has been caused by a certain Italian blindness to the possibilities of recreating as a repeating unit the piazza, not the formal thing attempted at Sabaudia, but the facile creation of which the older towns such as Genazzano, have so many examples.

That the architectural and social qualities of such places are elusive is well brought out in Ivor de Wolfe's The Italian Townscape, which significantly contains no examples drawn from modern Italian architecture, and in claiming the success of older Italian townscape bases it on no social or architectural law. Instead de Wolfe points

to an almost mystical relationship of earth, air, fire and water, in a matter-of-fact way. "Earth in this context covers any object that lies, stands or rolls upon our base, the land, an object being that which, no matter how trivial, contributes to the artefact town .." Again, "All buildings use air" . . . but . . . " the Public Authority approach to air is not the artist's" . . . . yet . . . . "air is the translucent element in which all the affairs of men take place as surely as fish use water".[24] The bearing of the argument is that artistry, not regulation, is the quality missing from townscape today. In the course of observation made during the present study, it seemed rather that the success of the piazza in the older towns, even of nodal points at street intersections which are not piazzas but the T-traps of de Wolfe's analysis of Sabbioneta,[25] has psychological reasons, such as habitual proximity of families to one another through generations. It could not fail to be seen and recorded that the new developments, even Sabaudia with its three decades of existence, had signally failed to produce socially assimilated and architecturally satisfactory centres, for even the carefully planned centres at the Pontine townships have not the life of their counterparts in the older towns.

Of the main piazza in the older town Peter Schindler has a description difficult to associate with a 20th century Italian building group, but well in tune with de Wolfe's melodious acclaim of the older Italian milieu. The scene is an un-named small town and the

time mid-morning as the siesta hour approaches when, even more than in the evening, the town centre performs its essential functions. Schindler is a Danish author, Italophile and priest, who lives in Rome, and in the present context of comparison between north and south his land of origin is not without some additional relevance. He writes (in Danish) :

> "We arrived in a little town an hour before midday, the hour the ancient Greeks called "the full agora", the time to close for the midday pause, so that while we park our car between the cathedral and the town-house, shopkeepers are closing their shutters and the craftsman his workshop. All are making their way to the Piazza. Peasants are discussing hay. I professori from the secondary schools and junior colleges sit down at the sidewalk cafes for an aperitif while their pupils and students sit at the furthest away tables in the hope that the waiters will not chase them away for having no money. Officials leave their offices and discuss politics with the academics over Vermouth".

He goes on to speak of the architectural setting :

> ". . . the plants in pots between the tables, the coloured parasols in bright primaries toned down by dust; the bleached bone-colour of marble; the blood-brown of mediaeval brickwork; the yellow ochre of later buildings; and the sun-faded green of the slatted shutters: the small Italian town can be glad it has all these to liven up the facades."

And he has a word for one of the piazza trattori:

> "It is whitewashed inside without ornamentation other than mirrors, flowers, greenery and a pair of advertisements. The chairs are made of fitted spars; the tables have coarse but clean linen cloths. Plates are unadorned and glasses thick and moulded. Bread, salt and vinegar stand there with a carafe of ice-water, ready to have a fiasco of local wine put beside it. This is not a place to linger in but to eat and drink and then go home and sleep.

> It doesn't draw customers by advertising but through its reputation for solid bourgeois cooking, good wine, cleanliness and ready service. You can see its wares yourself. On a centre table lie dry maccaroni and a variety of fruit and cheese, while behind the glass doors of the ice-box against the innermost wall are the fish, fowl or pieces of meat customers themselves can select to be handed over to the kitchen folk to cook. Wine and tomatoes give a red glow. There are green beans. The lettuce is dewy and crisp. The Parmesan cheese looks like a mountain avalanche. The sausage smells of white onions, and if we want a fiasco, there is a dust-laden battery of bottles on the shelf above the buffet. This is the idyll of the small Italian town . . ."[26]

Morris West describes a trattori in the Piazza Mercato in Naples, full of the glamour of slumland and shutting out its horror, which in another way suggests as its opposite the sterility of the too-neat housing development:

> "Inside the light was brighter and the air warmed by the glowing oven where the pizza was browning and the red sauce bubbled and heaved . . . . . half-a-dozen others sitting at the greasy tables shovelling pasta, gurgling broth or sipping the raw purple wine tapped from the casks next door."[27]

If such scenes, genteel like Schindler's, vulgar like West's, are not yet the idyll of the new housing developments, it is not because of lack of space. From Garbatella onwards it seems rather to be a matter of too much space undivided into those nooks and corners with which the old centres seem always well endowed. From such individually defined subdivisions, even of the smaller piazza, the local trattori takes an important part of its character. So do the shops which with the outdoor part of the trattori, give back to the

piazza a quality it, on the other hand, could not have without them. It is a case of outdoor space and indoor space flowing into one another by a traditional space-use which the details of the architecture may not even assist. Often the line of division is a thick wall with only small windows and narrow doorways not in themselves inviting entry. But the division follows a subtle line which seems exactly to enclose a space out-of-doors in which develops what Rasmussen (another Dane writing about Italy) calls in Danish "et broget torveliv" (a many-coloured piazza-life). He is writing about the piazzas of Rome and leading up to an analysis of Pietro da Cortona's little piazza of which the church of S. Maria della Pace is the centrepiece. The point he then makes is that the minute size of this open space in relation to the church is a necessary part of the drama of approaching this building, having previously pointed out how the interiors of Roman churches and their exterior approaches are an interplay of space and of delightful experience of space.

It would seem that Italian piazza-life has to do with that kind of experience just as much when the buildings are not churches but such things as shops and cafes. The in-and-out movement and its experiences are essential to the achievement of a many-coloured piazza-life. Piazzas of the inter-war years, such as that at the centre of Sabaudia, containing the church and the party headquarters, have not achieved it. But they came into existence, and are in fact the only thing of that kind possible to cite from any of the countries

studied, built in those years.

To many an Italian, such language is sheer romanticism, and the search for a language of architecture contained in it is probably one that takes place only when orderly, rational approaches to the creation of an environment have failed. To pursue it now would be to depart from the theme of this thesis. But it would be wrong not to realise, before embarking on a description of the step-by-step rationale of modern Italian decisions about housing space-provision, that the Italian architect on becoming aware of the modern social environment had more in his power than a rationale. He had, and still has, a mystique, especially in matters of townscape, of which the last may not have been heard. One case study, the proposed new town Gela in Sicily, suggests that a union of the two qualities may be on the way. The modern Italian renaissance can hardly be complete until this happens.

(2) The Active Steps.

In the situation that prevailed after the armistice signed at Caserta on 29th April 1945 (a week before the surrender at Lüneburg), much work of an emergency kind was done by UNRA, the United Nations relief organisation, but permanently to solve the problems presented

to view became the task of the new Italian Republic which came into being in June 1946 and adopted its constitution in December 1947. Under the constitution regional government was given an important place, with 19 autonomous regions. Provinces and communes (which numbered respectively 91 and 7,804 in 1951) are defined as autonomous bodies, but without uniform definition of their functions. The balance of things, therefore, placed the primary responsibility for housing at the regional level, the smaller communes in particular being unwilling to assume it. From what has been remarked in the context of considering Genazzano and its problem of conservatism or of inertia, this supine attitude by these lesser authorities comes as no surprise.

At the same time we find central government forging ahead of all local government by reaching a more synoptic view of the problem of housing space. We find the ministries in Rome seeing post-war unemployment and the housing shortage as related problems, and also giving prominence to the need for social insurance. A result of this was a new disposition of governmental functions, devolved where necessary on pseudo-governmental organisations. Chief of these in the social field was the Instituto Nazionale delle Assicurazioni (Institute of National Insurance) or INA, which gave its initials to the important daughter-organisation of INA-Casa, a central housing organisation under government sponsorship, having a regional organisation with something of the old independent character of the

instituti. The whole arrangement, unique within the series of countries studied in this thesis, stems from a historic bill introduced into parliament by the then Minister of Labour and Social Security, Signor Fanfani, to become Law No. 43 of 28th February 1949. This law established a fund to be raised by collection, over a seven-year period, of obligatory contributions from workers for the construction of dwellings to be assigned to them, either leased or bought by instalments, and as nearly as possible scaled to individual needs and resources. The fund got a government subsidy to prime the pump and to ensure a quick start both on loan-raising and on building operations which were to form an important part of the national programme for relieving unemployment by absorbing workers into the building industry. Needs had to be assessed quickly, and not much initial research was done either in the sphere of social science or that of architecture, but nevertheless construction proceeded on a widespread scale. It came under the control of the INA-Casa organisation which provided for drawing plans, both town plans and plans of house-types, under the joint control of a Consiglia di Gestione (Council), a Comitato di Attuzzione (Executive Committee) and an administration. This comitato is virtually a government body but true to the Instituti tradition, it possesses a considerable degree of autonomy. It has powers to set its own standards, and besides controlling the execution of projects it administers the dwellings it has built, as regards letting, inspection and maintenance.

To the INA-Casa administration is committed the preparation and commissioning of plans according to the directives of the committee and, in proceeding with actual construction, it covers a wide range of activity in matters of co-ordination, direction, methods, and also the setting of standards locally.

Because of the need to serve regions with greatly disparate economic and social conditions, space-standards and standards of equipment laid down by INA-Casa centrally are relatively few, giving the regions and other levels, in co-operation with regional councils and municipalities, the maximum freedom to suit their production to local conditions. These standards are in the first place a statement of general policy for new housing developments, which can be summarised as follows:-

a) density of population should not exceed 208 persons per acre and 147 in large developments; (this is taken as being a net density, the only kind being considered then).

b) apartments shall have double exposure and a sufficiency of daylight.

c) concentrations of apartments in districts which already are insufficiently furnished with civil and social services to be avoided;

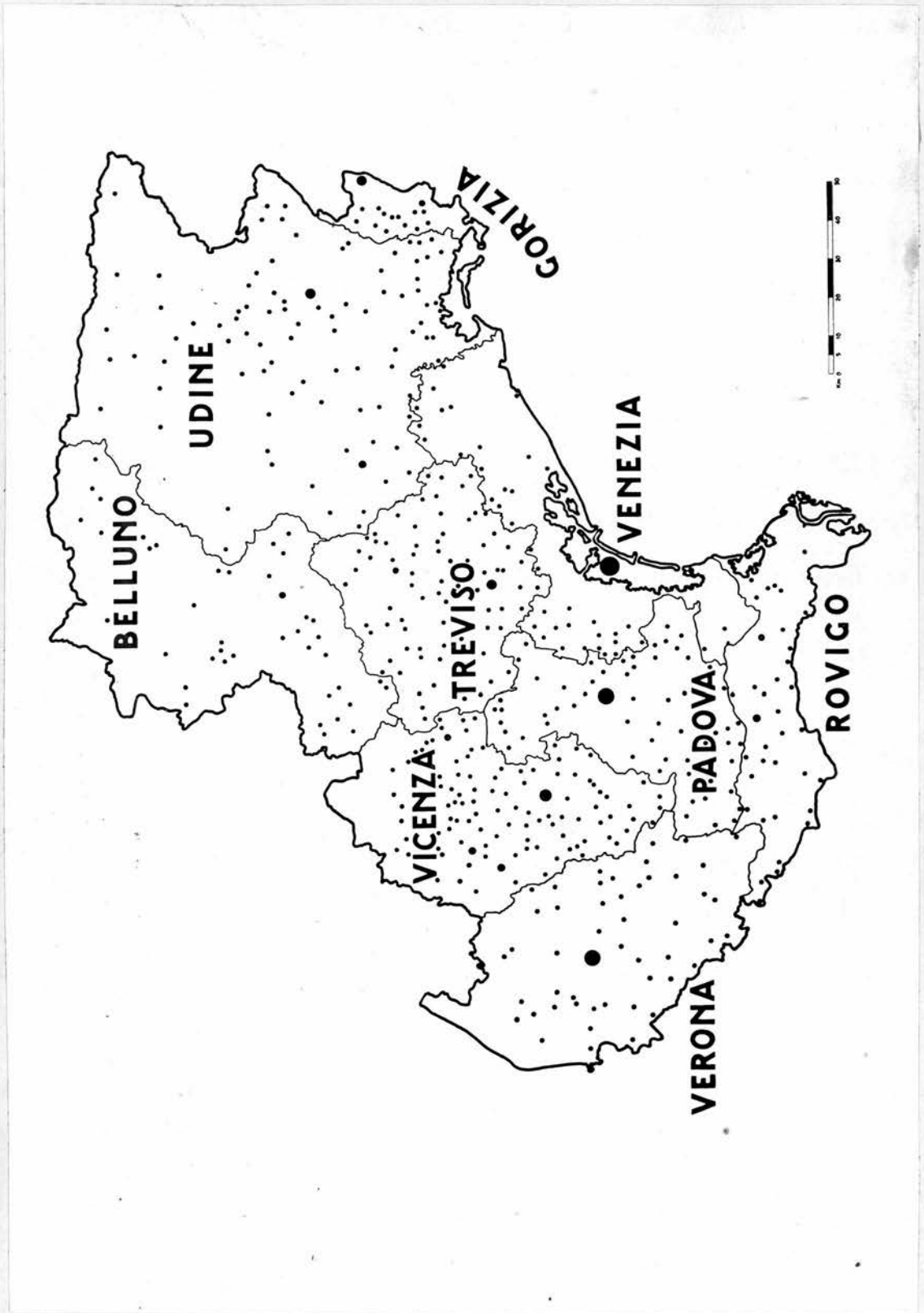
d) the insertion of buildings into existing town nuclei is to be favoured before the creation of new communities.

e) elimination of dirty and unhealthy dwellings is to be encouraged.

In large developments so far built, INA-Casa, in co-operation with the municipalities, claims in general to have furnished the necessary ancillary buildings for sanitary, social and religious use, and in particular to have provided every group housing 100 families with a social centre operating a wide range of social services. Reports, however, do not furnish figures, and the writer suspects that, as in other countries, such provision tends to lag behind. Tenants interviewed grumbled about the lack of such things.

The Instituti of the previous regime are not superseded by the creation of INA-Casa, but continue as autonomous bodies playing perhaps their most significant part in the drawing up of regional plans, which as in other countries have so far been mainly concerned with the location of housing. This doubtless was a wrong conception, but seems to have been inevitable in the particular post-war circumstances. The UN organisation, UNRA-Casas, likewise continues, partly integrated with the Ministry of Public Works and partly under its own new name of Instituto Nazionale per il Finanziamento della Ricostruzione (INFR), availing itself of loans issued by the State Bank.

With the establishment of INA-Casa by government, however, and its integration with governmental administration at all levels, Italy obtained for the first time a housing executive able to reach in an organised way beyond the main centres of population. It entered the



CHARACTERISTIC SPREAD OF INA-CASA ACTIVITY : A PROVINCE

smaller cities, towns, and even villages which hitherto had been neglected alike by central and regional government and had never taken their own steps of setting up through their communes their own Instituti. In its first seven-year period, 1949 to 1956, INA-Casa erected 160,000 dwellings, distributed among 4200 communes, ranging in size from Milan, with its lion's share of 27,000 dwellings, to such tiny rural communities as those of the province of Lecce, in the toe of Italy, where 3680 dwellings were built distributed between 73 local authorities. This total production amounted to about 50% of the total of all government-assisted building in Italy, and about a quarter of total housing production. Over the whole field of Italian housing, which includes considerable contributions from bodies other than those government-sponsored, production figures reveal the pre-war decline, a low wartime production (largely related to war industry) and a steady climb from 1946. The following table shows these trends, in all 3 columns. It comes from Ludovico Quaroni's paper L'Abitazione per le famiglia a basso reddito in Italia, published in Urbanistica 31.

Dwellings constructed, projected and demolished in the period 1935-54.

Year	Constructed		Projected		Demolished	
	No. of dwellings	No. of rooms	No. of dwellings	No. of rooms	No. of dwellings	No. of rooms
1935	84,514	395,427	104,223	475,808	3.787	17,640
1936	97,978	439,810	58,668	271,919	1.208	6.560
1937	75,418	335,624	61,550	285,467	2.008	9.840
1938	49,793	227,274	70,527	334,963	1.834	8.567
1939	49,225	234,565	78,406	381,077	2.717	12.250
1940	42,286	202,565	44,802	218,141	1.964	9.148
1941	25,472	121,041	35,135	173,585	689	2.940
1942	23,462	111,495	16,496	80,844	273	1.412
1946	33,818	142,886	65,864	302,817	4.755	22.291
1947	27,453	127,577	73,926	351,548	3.370	16.564
1948	36,575	193,556	70,924	384,540	2.488	12.166
1949	45,675	259,135	121,322	701,657	2.752	13.896
1950	73,422	451,935	164,809	1.021,084	2.830	14.929
1951	92,582	592,468	188,973	1.224,109	2.527	12.241
1952	116,126	794,377	208,118	1.353,435	2.560	12.241
1953	148,956	972,658	283,308	1.850,162	4.135	20.218
1954	177,434	1.174,043	320,070	2.130,204	5.006	24.715

On this table the definition of "room" is not that of the room-unit of the national census, including kitchen and bathroom space of equal area. On the contrary, kitchens and bathrooms are counted as rooms. This explains the arithmetical relationship between numbers of dwellings and numbers of rooms.

To this table can be added that in 1954 it was calculated that in the next ten years Italy needed to build 1,000,000 rooms per annum in order to clear slums, abolish co-habitation, control overcrowding and to provide for natural increase of population.[29] By 1959 the total figure needed over ten years had risen to 13,000,000, but this was through a raising of standards rather than miscalculation or default.[30]

Quantitatively, INA-Casa has not reached a position of leading decisively towards global housing objectives. It has had to operate within severe limitations, of land available, of money, of staff, of political opportunity. Qualitatively, however, it has led the way decisively, and one reason for that is an early decision to employ architects, and indeed to engage leaders of the modern architectural movement. Thus we find that the case study material from Tuscolano, Rome, includes work by Adalberto Libera and Mario De Renzi. Recommending the use of architects to other housing organisations on the basis of INA-Casa experience, Professor Bruno Zevi wrote in 1952:

"Contrariamente a quanto il pubblico immagina, la casa popolare costituisce uno dei temi architettonici piu ardui, difficili e appassionanti..... In questa anni, i migliori architetti si sono dedicati..... L'entusiasmo col quale gli architetti dell' INA-Casa hanno affrontato il lavoro e i successi riportati dimostrano che essi erano preparati al compito. Non solo psicologicamente, ma tecnicamente."

Difficult work like designing social housing needed accomplished, dedicated men, but Ina-Casa had found them, and now it was for the public to know.

A problem was the extent of architectural participation in layout. By tradition, going back into the 19th century in Italy though not any earlier, road layout and also site disposition was the job of surveyors and highway engineers. Thus, with the addition of architects to the design team, there came pressure to consider layout from other than an engineering point of view. There was also pressure, not only to take up other points of view within a given limited housing development, but to adopt an architectural-social approach to layout in the wider sense, embracing more than one development. In good examples such as the pair of developments at Tuscolano the result is fair, but it is probably not ungenerous to say that the promotion of civic design in Italian housing still suffers from its traditions and background, at any rate those of the immediate past. What is lacking is administrative and technical co-ordination, and the problem is well known.

A step towards a solution to this problem was taken in 1959 with the establishment by central government of an organisation abbreviated to CEP from its full name of Quartieri Coordinatori del Comitato di Coordinamento per l'Edilizia Popolare. Its task is to develop co-operation

between the various housing bodies, compare different attitudes to problems, different needs, working methods and results achieved; to bring out the essential problems of co-ordinating housing within the framework of building as a whole; and in general to find a way towards improvement in financial, administrative, technical, productive, urbanistic and social aspects of the regulations which control housing. The result it is hoped, will be more complete housing developments, socially and architecturally.

INA-Casa's architects had as their first task the preparation of type plans. Some of these are illustrated with the case study material and show how the problem of associating Italian traditional habits of living with modern architectural ideas was in the first place tackled.

Despite a fairly clear working pattern in the plans of pre-war housing a primary need now was felt to be that of distinguishing between functions: sitting, eating, cooking, sleeping; the words in Italian being soggiorno, pranzo, cucina, and letto (meaning bed, further distinguished between letto and letto matrimoniale). The bathroom, being first of all the place for urination and excretion, is still rendered as gabinetto, the colloquial expression used from long ago, before piped or water-born sewerage became a generally adopted method of disposal. The entrance hall, ingresso, is given the importance both of its own functional word and also, when plans were drawn, a generous space allocation, continuing earlier housing custom. It is interesting to observe that in INA-Casa usage a loggia is an open space

recessed into the house while a balcone is the kind which projects from it. Though not by any means universally accepted in modern Italian this is a more sensitive piece of nomenclature than, for instance, the Danish altan, a philological corruption of balcone, used for both things, and it attempts a clarity of definition greater than the words balcony, verandah, loggia, and the more recent addition "outdoor room" provide in current English.

The Italian names are reduced to index letters: S, P, C, L, Lm, for the major space functions, and for the lesser space functions, a series of letters in lower case: g, i, l, and b. This enabled plans of a diagramatic kind to be drawn in which space functions were grouped variously. SP meant sitting-room with dining table; SPL, the same with a single bed or bed-settee added; PC a kitchen with dining table, and so on. At the same time opportunity was taken to loosen the rigidity of plan which had characterised pre-war housing. A report published by INA-Casa in 1949 depicts basic groupings of rooms and functions and proceeds to demonstrate how these can lend themselves to a variety of architectural interpretation, first in plan, then in elevation. Illustrations from this report are reproduced with the case study material showing three variations of a basic arrangement of a 3-room flat, followed by two examples of architectural variations of one of them.[31]

Floor areas in the basic plans lie between 810 sq. ft. and 870 sq. ft., excluding the common staircase. Assuming 4 occupants of each dwelling, this at 3 rooms per dwelling works out at about 75½ sq. ft. of

room, plus use of kitchen and bathroom, per occupant - nearly 12% less than was laid down in the days of the Instituti, though near the more realistic standards of the other countries. This is a measurement of the extent to which the Mussolini period's strivings to create housing space at all costs starts to reverse in the post-war period as the demand for equipment and services grows, also, one may legitimately suspect, as the purchasing power of the Lira falls.

The INA-Casa type plans show significant departures from hitherto customary presentation of house plans. First to be noticed is the delineation of furniture and storage cupboards in the house, besides such fixed equipment as sink and cooking bench, W.C. and basin. This may be discerned as the work of architects supporting the architectural movement just described and trained under the socially conscious regimes which began to take control of the schools of architecture in Europe during the 1930's, greatly extending control in the next two decades. At the same time it is observed that the placing of furniture is somewhat naive. A sense of order and balance of composition is expected in the occupant not forthcoming in reality. Planning for an Italian household of the 1950's, it was little more than a hopeful gesture to arrange arm-chairs in a semi-circle round a corner fireplace in the soggiorno or living room, for in the course of this present study it has become clear that the accepted central feature of this room is the formal dining table and the chairs. These are shown too in early INA-Casa plans, but in an assymmetrical position whereas from observation the normal usage is to place the table and chairs symmetrically about an axis, even two

axes. Comparative plans shown illustrate the architect's prediction on the one hand and the reality on the other.

Again, it was optimistic to assume, as in one plan illustrated, that a complete wall of the main bedroom will in fact be occupied by wardrobe space so arranged that three severely functional wardrobe units exactly fill the rear wall of the bedroom concerned. Observations made suggest that this wall or some other convenient wall in the bedroom, is usually filled or nearly filled with one large wardrobe of ornate character, holding indeed the clothes which husband and wife naturally want to keep in that place, but not fitting exactly into the space provided.

The same generally applies to cupboard arrangements in the hall and passages. It is also noticed that whereas the INA-Casa plans show a complete furnishing of the kitchen, including sink, cooking bench and feeding-nook, this completeness of furnishing seldom appears in the kitchen itself unless the tenants provide it. Provision, limited under the stringency of money, generally stops even today at the cooking bench with its hood and the one-piece vitreous china sink unit, just as in the days before the war.

In these and other respects there is a difference between the early plans of the 1940's and those which represent the more settled policy of INA-Casa of the late 1950's and early 1960's, of which two examples are also illustrated. Here the furnishings are assumed to be available in the form of mass-produced units. They are also assumed to be designed by industrial designers aware of space limitations, for the

dimensions of partitions separating bedrooms provide accurately rationed space for the beds and for unit-built wardrobes. Anything bigger will not go in unless something else is omitted.

It is also noticed that items which do not appear normally in the inventar of workers' flats in other countries appear on Italian plans. One such is the sewing machine, an important item which appears on later INA-Casa plans amongst the bedroom furniture. This is a recognition of the space demanded by a modern development of the custom which the Italian housewife retains, as already referred to, to sit outside her door and sew by hand. She is not usually doing ornamental sewing. She is making the family's garments; shirts for her menfolk, dresses and blouses for herself and her girls. For the main runs along seams she uses her sewing machine indoors and observations made in the present study suggest that to own a sewing machine is common enough at least in the industrial north, to justify a space-arrangement designed to accommodate it. Many of the women there are employed in textile factories either in weaving cloth or in sewing it together into garments. Skill in using loom and machine is well developed, and it is a short step for a woman to carry her skill, learned in industry, into the home. Conversely, the modern Italian garment industry, as flourishing a part of the economy as any, owes much to the hand-sewing tradition and to acceptance of the sewing machine as part of the artisan and middle-class housewife's equipment. It is worth notice, in passing, that the art of hand-sewing, whether

utilitarian or extending to embroidery and lace-making (such as Milanese point) is by tradition convent-taught. Freya Stark, brought up partly in Northern Italy, describes being taught to sew by Italian nuns of the decade before the first World War: "The sewing was very thorough - days and weeks over samplers of plain stitches before we reached the excitement of embroidery, and a ruthless unpicking if a false stitch were detected ever so far back. As a reward, months ahead, we were promised the sewing of a shirt for Papa, every seam to be stitched by hand, counting the threads of linen for each stitch".[32]

The mechanised version of this together with hand-sewing is described by the novelist Alberto Moravia, who is the son of an architect, writing in 1949 with a setting in Rome itself: ". . . . . in the afternoon I shut myself in the living room and sewed until nightfall. My mother worked at the sewing-machine in the window and I sat at the table sewing by hand. There were always buttonholes to make and reinforce, and every shirt had to have its initials. These I knew how to do particularly well, raised, firm, so that they seemed to stand out against the material".[33] In this case, fictional but realistic, the older woman was the seamstress, still a common form of home-employment, aiding the factories.

That the INA-Casa type-plans show the sewing machine in the main bedroom is not an oddity. This was frequently seen in the course of the present study, but the case at the agricultural township of S. Romualdo near Ravenna, illustrated and described at length below, shows the more usual position, in the soggiorno-pranzo.

The house is new but the furniture and mode of placing it comes from an older existence. Much that was observed suggested, however, that whether the mechanical job on seams was done in the space set aside for the function "soggiorno" or that called "matrimoniale" the Italian housewife enjoys her hand-sewing still and, even at the price of slower production likes to do as much of it as possible in her chair outside, where she can enjoy the society of her neighbours. This custom, it is here predicted, will die hard. Instances were observed of the housewife taking her chair from her flat two storeys up or more to the entrance door of the block and sit there with others who had done the same. Whether or not INA-Casa's staff contemplates this happening, it plainly sees a duty to attempt to sort out within the dwelling all the functions comprehended by the term "soggiorno", the sewing-machine representing only one. Hitherto that piece of equipment and its activity have been entangled with other activities, eating being the commonest; and clearly it is felt that to disentangle things there should be a more specialised use of space, also taking account of activities which are not concurrent but consecutive. Removing the sewing-machine to the same room as the matrimonial bed is on the assumption that sewing, by one matrimonial partner, takes place while the other is elsewhere, and while neither wishes to use the bed.

Again it is assumed that low arm-chairs and television can be placed in the same room as the dining table and high chairs, since it

can be taken as a rule that eating from the table using high chairs is followed and not accompanied by watching television from low chairs. The television instrument appears first in INA-Casa plans after 1952, but by 1959, when the present study was begun, it was often found in practice to occupy a recognised place within the soggiorno function, placed where it could be seen, if not watched, from the high chairs at the table besides being watched from the low chairs.

Later INA-Casa type plans, "elaborati d'ufficio", go into considerable detail, the fullest encountered in any of the countries selected for this study. Structural finishings are drawn in full; plaster, door standards and doors, with pictorial representations of sanitary fittings, showing also plumbing stacks, and (as in earlier plans) electricity outlets and switches. But now moveable furniture is shown in detail too, and not just the main pieces but also such lesser things as occasional tables and small dressers. Where it matters, door-swings on moveable furniture are indicated to prove that the required clearances have been provided. This is in fulfilment of the kind of injunction given, for instance, in the UN's Utilization of Space in Dwellings; "The designer of a dwelling ought to have a clear picture in his mind of the functions to be performed and the furnishing in each part of the dwelling before its internal arrangements and the size of rooms can be determined" . . . . . although . . . . . "it does not necessarily follow that a family occupying

the dwelling will use the rooms as intended."[34] Even if this does not follow, the publication of such plans, aiming at promotion of better space-use, in the long run, may well have the effect of helping Italian space-users in new housing to make the best possible space-use out of space-provision.

What these type-plans have accomplished in modern Italy is two-fold. First a certain standard of space-provision in work designed and carried out by the INA-Casa organisation itself; and secondly a similar, if not higher standard in housing carried out by other organisations, such as industrial firms for their employees or government agencies building for their tenants or protégés.

In pursuit of the present study, examples of all three have been visited: INA-Casa work in Rome and elsewhere; Olivetti Company housing at Ivrea; and one example of housing and ancillary buildings forming a rural settlement at S. Romualdo near Ravenna built for smallholders by the Ministero Agricoltura e Foreste. There are also case-studies of private houses, in the form of flats, a villa, and an old country house modernised for the seasonal occupancy of spring, summer and autumn visitors who - it will readily be imagined - constitute a housing space problem of their own as they flood into this popular holiday country. Finally there is a study of the new Sicilian town of Gela.

CASE STUDIES

(1) HISTORICAL MATERIAL (indexed with submitted drawings etc.)

(2) TUSCOLANO : FLATS and PATIO-HOUSES

The INA-Casa work studied in Rome is the large development Quartiere residenziale al Tuscolano on the southern boundary hard by the Rome-Naples railway. It is close to a substantial remaining length of the Aqua Claudia, one of the eleven aqueducts which together fed the ancient city with 350,000,000 gallons of mountain water daily. The gaunt outline of this fine piece of functional design fills the background to the west, beyond the railway, which fortunately runs in a cutting.

The part of Tuscolano studied is a mixed development of tower flats, medium height slab-blocks and an unità d'abitazione orizzontale of single-storey patio-houses. This unità, the work of the late Adalberto Libera, is an expression of his belief that the collective unit of housing need not find its only expression in a single tall building of the Corbusier kind. Not only is this unità, therefore, a notable group of patio houses, ready for comparison with other such, but it is to be compared with the Corbusier unità at Nantes case-studied in the France chapter, although it has the advantage over his of being part of a larger unit.

Libera explained in a few words how the needs of modern urban life, the organisation of modern collective facilities and his awareness of a mediterranean tradition made him apply to the social hypothesis of this kind of unit, the horizontal solution:

> "Le esigenze del moderno viver civile, che chiedono la organizzazione collettiva dei servizi, e le indicazioni della tradizione mediterranea relative al clima trovano coincidente soluzione nel progetto di questa unità di abitazione, che è un'altra delle ipotesi dell'edilizia moderna: L'unità di abitazione orizontale"[35]

At the time visited (1959) construction at Tuscolano had been proceeding slowly for some seven or eight years and much remained to be done. The population planned for is approximately 6000, distributed as follows:

10 storey towers	1500
3 storey flats	2000
4 storey flats	1600
1 storey patio-houses	900

Dwellings vary in size. In the flatted blocks the changes are rung between 3-room and 4-room flats, often within the same block, usually by the common device of adding to one of two flats sharing entry from a stair landing an extra room occupying a space opposite the stair. Unexpectedly, the patio houses reach the largest size, ranging from four rooms to five. A 4-room example was studied in detail and is illustrated. Of the flats, the 10-storey towers are a notable essay in separation of dwellings, using a central staircase, light-wells and loggias to accomplish both this feat and also that of obtaining openness and informality, so that as the stair is ascended there is a feeling of being in a steeply stepped street, like those of some Tuscan hill-towns. This is accentuated by the acute and obtuse angles introduced by the

architect (Mario de Renzi), on the stairs, in the flats and on the loggias. Each flat has a loggia outside the kitchen, where meals can be taken - and are indeed taken: it functions well as a dining room at least from Spring to Autumn - besides a balcony projecting from the sitting room. Not including loggia and balcony the area of each flat is 870 square feet. A feature to notice is the storage space at each flat entrance, except in the case of one flat on each storey where this space is occupied by the elevator. But, as elsewhere in Italy and the other countries visited, storage is done in places not designed for it. A number of tenants use the loggia for storage, and not a few the balcony, taking advantage of the fact that, unlike similar nooks found occasionally in older property of this irregularity of form, these spaces are not accessible to thieves.

These flats at Tuscolano bear some comparison with those at Bellahöj in Copenhagen. In the Danish example there is also a spirited attempt to make the staircase and lift less enclosed than is usual in buildings of this kind. The glass-faced stair results in a northern counterpart of the open-work of this Italian example. But the Danish flats have no space anywhere as charming as these loggias off the kitchen with their subtle space-relationship with the stair, and sense of neighbourliness.

Designed by Adalberto Libera and built in 1952, the patio-houses at Tuscolano are modern Italy's earliest attempt to revive this ancient and indigenous house-type. The design was based on research by a

distinguished team, working with Libera, Pagano, Diotallevi and Marescotti, and in the design attention was paid to two characteristics of the best ancient examples, which have also been selected for special attention in the present study: privacy, without which the patio-house loses much of its reason for existence; and the opposite, intimacy between neighbours. The one is achieved within the house and its wholly private little court; the other in the narrow pedestrian lanes which run between the groups of houses, roofed-over in a delightfully informal way at each house entrance. These flag-stoned lanes appear to generate some of the neighbourly, communal living characteristic of the narrow traffic-free streets of those hill-towns, such as Genazzano, where motor traffic does not penetrate.

In the sample house visited and studied, the tenants were pleased with these qualities, remarking particularly on the safety from traffic dangers their small children enjoyed. They were pleased with their house, which to them, coming from a very low income group, it seemed, was luxuriously spacious; their sparse furniture supported this evidence and even with a mother-in-law in the house (see illustrated plan) the father, mother and three children had enough space of all the kinds needed. A tenant in a flat overlooking the patio-house development was asked if she preferred her own type of dwelling or would rather have one of the patio-houses. She preferred her own, and called the others "chiuso" (shut-in), with a kind of

shudder, as to suggest claustrophobic sensations. Taxed with this, the patio-house dwellers on their part vigorously denied any such sensation.

Their favourable reaction may be partly the result of care taken to vary the sense of enclosure which each patio creates. This is done by dividing each block of dwellings extending between the access lanes into groups of four, so that three of the patios come together in the centre and so create a sense of a large space while each remains wholly private. The fourth has the lane running along one side, and while separated from it by a high fence feels the presence of this friendly little thoroughfare. Thus each patio is psychologically compensated for its small size and its enclosed character by the presence of other adjoining open space. Conversely, the lanes are themselves protected from too much overlooking from the houses. From houses flanking the lane only two windows overlook it: one the kitchen window, the other the dining part of the soggiorno. This arrangement resulted too in a very economical use of the available land, the nett density being thirty dwellings per acre.

This Italian patio-house development is interesting to compare with the Copenhagen "grenhuse" development (Chapter 5) and with the Prestonpans patio house development in Scotland, in both of which there are patios wholly or almost wholly private and also narrow pedestrian lanes. Tenants there, too, liked their privacy and their children's safety. In all three evidence was found of neighbourly

contact between households. In all three it was stated emphatically that this was easier to establish than on a common stair and beyond all comparison easier than it is in houses fronting a street where wheeled traffic passes.

The effect of the partially covered street in the Roman example is perhaps less positive than in the two northern examples. True, it provides shade, but a wall can provide this, and Italians are prepared to seek shade and coolness within their houses. In the northern examples the cover provided is particularly liked by occupants for its shelter from wind and rain, against which a mere wall has little effect. Every second street at Prestonpans is covered and every other given a pergola treatment: in Copenhagen all have a pergola, with a rich creeper cover, which provides some protection from the weather, even in heavy rain.

A disappointing feature of this Roman patio-house development is the treatment of the communal open space which - appropriately - separates it from the block of shops and garages serving it and the rest of Tuscolano. Here shade-trees and other landscape features of a human and softening kind would have been welcome; instead there are hard standings and little else, creating a barrack-like atmosphere. It is noteworthy, however, that the path system takes the sensible if architecturally unbeautiful form of radiating from the site entrance, adopting the lines along which people are bound to travel if left to decide their own routes. This compares favourably with the pretty but

irrational arrangements at Marly-les-grandes-Terres (see Chapter 7). On the other hand, the hard standings used at Prestonpans and Copenhagen seem to achieve a more humane and less barrack-like character. In all three cases the children play happily, and their play, duly observed, seemed to imply no architectural criticisms. In the Tuscolano example the older ones were out in the open-space enjoying the hard standings; the infants either were shut into court-yards or were pottering about the doorways of the houses. A mother was seen rescuing her small piccolo, aged 2½ or so, from involvement with the older children, who were moving about too fast for infant safety, but in doing so she revealed the difference from having to do the same thing when the fast-moving objects were petrol-driven vehicles. It was a movement entirely fearless though not without anger.

(3) FLATS AT POGGIBONSI

Near Poggibonsi on the road northwards from Rome a 3-storey block of INA-Casa flats was studied briefly, as characteristic of what is being built in and around many Italian towns of medium size where tall blocks would be unecomonic. It is not a building of architectural brilliance but neither is it without its points of interest. Whereas the patio-houses at Tuscolano compared with work at Prestonpans, these

Poggibonsi flats showed points of comparison with flats at Cumbernauld. In both cases there is a central stair with a well lit from above. This involves consequent improvement in sound insulation between flats and otherwise a better relationship of landings to the individual entrances to flats, more spacious and yet more compact than is the case when the stair is interrupted by a landing at half-flight. The sample flat visited was on the top floor and contained three rooms, with kitchen and bathroom. The floor area, approximately 700 sq. ft., is slightly less than that of the instituti period flat of the same number of rooms quoted in Section 1 of this chapter and illustrated with the case study material, a sign that the forlorn ideal of the Mussolini regime for generous space has again had to suffer some shrinkage.

These flats were not yet occupied, and opportunity was taken to go round the flat with a site foreman and record his ideas for the arrangement of rooms and furniture he would have placed there had the flat been his own. This is the arrangement the case study drawing shows.

Of the three rooms, the largest, 17 ft. by 13 ft., or 221 sq. ft., is the characteristic living-dining room with sideboards, dining table, settee, sewing machine and television set, of the Italian family which has been earning steady wages and has acquired the conventional quantity of household goods. The family of parents and three children would live in this room, one of the children sleeping on the settee, the other two in bunks in the small bedroom. The larger bedroom would

be kept for the parents' use. It would suffer from no complicated furnishing, but remain cool, uncluttered, and be kept spotless. Earlier in this family's existence there would have been a child's cot beside the letto matrimoniale, but child had grown out of cot and there would now be some considerable pressure on space: the lack of a third bedroom would be felt, but it was quite usual to have at least one member of the family sleeping in the soggiorno. In his present dwelling two of them did this, and it is to be noticed that the INA-Casa type-plan for a two-bedroom flat illustrated shows that arrangement, as do the other type-plans. He was emphatic, however, about the furniture arrangement. The table must stand in the middle, the television in the corner away from the light. There was nothing to be said for putting the table against a wall: it would just be less useful. There would be a table too in the kitchen. He was vague about how many it would seat: it seemed to the writer that three or perhaps four was a maximum: never mind; a fifth chair would be brought in from the soggiorno. One would have liked to have had the wife's opinion, whether or not it would be more practical to carry the food across the hall to the dining table. This had to remain an open question.

It was noticed that the bathroom, with bath, basin, W.C., bidet and hot-water cylinder, was furnished well up to INA-Casa standards. This room, the foreman said, would be used too for clothes washing and there would be a washing-tub added. This space-use was well borne out by information (and photographs) obtained in the flat described in

full occupation at Ivrea.

(4) IVREA : OLIVETTI HOUSING ; TERRACE HOUSING AND FLATS

Ivrea, capital of the Cavanese district, lies at the foot of steep hills on the left bank of the Dora Baltea river where it debouches from its deep Alpine valley on to the northern plain of Italy. In the past its function was to guard the St. Bernard passes and it was the seat of a Langobard duchy and a Carlovingian margravate. Now it is a manufacturing town of 20,000 in habitants specialising in cotton, rayon and the manufacture of Olivetti typewriters. The latter interest has brought to Ivrea a strong consciousness of modern design. As an example of Italian industrial production the Olivetti typewriter has a wide reputation, and as modern Italian architecture the Ivrea factory in which these machines are made is well known for its combination of simple functionalism and gracefulness, expressing in many ways the qualities of the typewriter itself. The main building has been widely publicised and needs no other reference here.[36] But the Olivetti company has also made itself responsible for housing its employees and in this field of design too has done some notable things.

The company housing lies on a flat site in its own development west of the old town and sharing with it the background of Alpine foothills and a rich vegetation, this being alluvial land. Some of the housing

groups are known from architectural journals, particularly a group of flatted blocks on three and four floors which surround a small court in which stands a shed for children's games - an interesting space-use seldom encountered in any of the other countries and nowhere else in Italy. The group comprises three buildings, one of which has a north-south orientation and the other two east-west. Altogether there are 48 flats, each containing an ingresso, a soggiorno-pranzo arranged jointly in one space in the smaller dwellings and separately in the larger, cucina, bagno, and one, two, three or four bedrooms. There are certain communal services all in the ground floor of one of the blocks: a portineria (flat for a caretaker), a lavanderia (laundry), garages and storage for cycles and motor-cycles. All the flats have hot-water supply and central heating. This floor has a special plan, but those above are arranged so that within a standardised construction for the central section, there may either be two flats of one and three bedrooms respectively or two of two bedrooms, it being possible to make an adjustment of this arrangement to suit tenancies. Similarly, in one of the other blocks, some flats can be expanded by incorporating a room from another flat on the same floor. The principle of flexibility of size in relation to tenants' needs from time to time is well served.

This is a scheme in which climate has been considered, particularly protection from the cold north wind which in winter blows almost continuously down the Alpine valley from the St. Bernard passes.

Consequently the block orientated north-and-south on three identical floors has a north wall consisting entirely of an insulating bank of bathrooms, kitchens, and staircases running along the block. Its south wall, on the other hand, consists of balconies - rendered in the Italian description as terrazza. In the other two blocks similar balcony space, varied in character, is distributed between east and west facades, the soggiorno-pranzo area facing west and the camera da letto area east. The cucina follows the pranzo to the west, thus making food-storage a problem except where tenants provide a refrigerator - and the bagno faces with the bedrooms.

The average size of a single-bedroom flat with separation of soggiorno and pranzo is 650 sq. ft., without separation 432 sq. ft.; a two-bedroom flat 864 sq. ft. and 650 sq. ft., a three-bedroom flat (which has in each case a large combined soggiorno-pranzo area) up to 918 sq. ft. and the four-bedroom flat up to 908 sq. ft. These Ivrea flats, therefore, are spacious by INA-Casa standards and the larger ones touch the kind of space-provision envisaged in instituti days but by providing it better accomplish more. This improvement is carried further by the terrazza provision which extends the use of all rooms served, increases storage space and releases claustrophobic feelings. Tenants spoken to praised this provision highly. On the other hand ground-floor tenants, who are in some cases given small gardens as an extension of the space which up above is terrazza space, had comparatively little praise to offer. These gardens are too much over-

looked to be much used, but there was no doubt about the usefulness of the covered play-space. Both in hot sunshine and in heavy rain it is much in use. A feature noticed was the pair of mature fir trees planted hard-by as part of the layout. The writer filmed the planting of such a tree at a site in Rome and a "still" from the film is illustrated.

Housing of the same type by the same architects (Fiocchi and Nizzoli) has also been built at Ivrea in parallel terraces facing east-and-west. A colour photograph of these is given. Records of room-arrangements and furniture placing were not taken but it appeared from observation that, as elsewhere, the separated soggiorno-pranzo spacing designed by the architects was not used. Of the two spaces, that furthest from the kitchen simply became an extra bedroom.

Terrace housing at Ivrea by the Olivetti Company was also visited and studied in detail as regards space-use to see how Italians use this northern European house-type. Plans with positions of furniture and also photographs illustrate how, given enough space, the Italian worker who is entering the middle class through this well-paid industry employing only skilled workers, is in general prepared to use space to reach middle-class standards of comfort. They also show how, with the more powerful induction of particular room arrangement which terrace housing produces (bedroom upstairs, other rooms below), the prevalent Italian habit of mixing up bedrooms and living rooms encountered at Poggibonsi and in INA-Casa type-plans is halted. Indeed

the furniture pattern is much that to have been expected in the northern countries, noticeably different from anything else seen in Ivrea, where nevertheless, northern influence is understandably strong.

These terrace houses (also by Fiocchi and Nizzoli) provide less flexibility of dwelling-size than do the flats but at 1080 sq. ft. are more spacious. Each consists of two bedrooms upstairs (camera di letto and camera di letto matrimoniale), bathroom and a wide landing capable of taking storage furniture. Downstairs is an ingresso unusually limited in size for an Italian house, a kitchen and a combined pranzo-soggiorno space with floor-to-ceiling windows opening to a covered verandah of which one half is open to the garden and the other screened by a wall of open-work formed in terracotta blocks arranged in a geometrical pattern of small hollow spaces. This has the important function of screening the soggiorno area from the midday sun without resorting to shutters and so encouraging it to be used during the siesta. The space in the verandah thus screened was found to be used in most cases for storage, occasionally for clothes-drying, a space function which photographs reveal to be spread over much of the garden facade. Below the houses and verandahs is cellar-space, the only occasion on which this return to an older and very useful Italian tradition was found to be resorted to in modern Italian housing.

In the centre of each house stands a chimney so placed that a kitchen range and a living-room stove could feed into it. The writer's visit coincided with the installation of district heating throughout the

company's housing and now radiators take over the space-heating function while cooking has gone over to a combination of gas and electricity, the cooker being arranged for both. The district heating arrangements of steel pipes in concrete troughs under the sidewalk had a familiarly Scandinavian appearance and added to the impression of an Italian north moving quickly into line with technical developments beyond the Alps, in this case assisted by proximity to the Alpine climate already referred to as a factor which creates within a certain sphere of influence conditions like those of countries further north.

In the sample terrace-house visited, the room uses followed the intentions of the plan almost without defect and the room arrangements had only resulted in one improvisation: a curtain separating the teen-age daughter's bed from that of her brother (see photograph). Not quite a defect, though perhaps a clumsy arrangement, was the presence of a table and chairs in a kitchen rather small for eating in, all in addition to the dining table and chairs standing in the pranzo area through the adjacent door. The usual explanation of this widely discovered state of things was offered. The one table was for formal meals (six chairs; family plus two), the other for informal (four chairs; family alone), and it was as in other cases further admitted that formal meals were largely confined to Sunday midday unless there was a visitor. It then transpired that the kitchen had been made bigger by request in order to accommodate a table in this way. It involved losing a small lavatory by the ingresso, for which the door remained, incongruously,

Here, however, we come back to the characteristic of the Italian sala di soggiorno as a workroom, for at the hour of the writer's visit (mid-morning, with the midday meal cooking in the kitchen) the table in the pranzo area was in use at one end by the daughter of the house studying for exams (see photograph). She deserted this task to watch with greater interest the process of measuring and drawing floor plans of the house. Even so, when the time came for her mother to offer wine, this too was done in the kitchen, not made the occasion of an invasion of the pranzo or the soggiorno area. Schoolbooks remained spread out in the one while in the other the heavily stuffed armchairs and sofa remained inviolate under chintz covers. It was noticed, though, that these covers were for use, protecting back and arms, and stains on them showed where heads and hands had rested. Clearly this living room furniture, the first of its kind encountered in Italy occupying space intended for it, was in regular use. It was then that the T. V. set was seen and the explanation which followed that the room was used during the siesta work-pause and in the late evening was easily understood.

In this house as in others the lavish quality of dining furniture was noticed, particularly the two sideboards, one with its upper tier devoted to a glass-fronted display of wedding-gift china, and its lower tier to more functional tableware; the other to general storage.

In the bedroom the mid-morning state of things was photographed; mattresses turned and airing, with all windows wide open and the

bedclothes hanging over the balcony front. Over the letto matrimoniale hung a sacred carving of patron saints watching over the family as it is produced and brought up and as its life goes on. This variant on the use of the crucifix was often seen in Italy, less frequently in France and Bavaria.

The bathrooms of this Ivrea housing are up to INA-Casa standard. There is a W.C. of the northern European kind, and a bidet. This very civilised item comes to Italy via France and, it may be justly remarked, seems to be taking longer to reach countries north of France. The bath stood full of soaking clothes, a prelude, we were told, to putting them through the washing machine - a simple affair with a rotary agitator, but also containing a spin-drier, which stood not in the bathroom but on the stair landing outside. There was a medicine cupboard in the bathroom in rather a difficult place to reach and some additional washing in a plastic basin standing on the floor. There was a toilet-roll holder, an object not yet common in Italian bathrooms. Did the presence of a chamber-pot on the floor have anything to do with a previous existence in which father or mother lived with a tazza? This did not seem so but with no young children in the house this pot lacked any obvious reason for existence. But the question would have been a difficult one to ask.

Obviously this was a family well on its way out of working class conditions, having, also, it is assumed, engaged in family planning, and in this way avoided overflowing its house.

By comparison, the INA-Casa type-plan of a terrace house, slightly smaller in area but having the same number of rooms, imagines a family of seven persons, with space arrangements in which the soggiorno function goes back to being part only of the larger downstairs room.

External arrangements were as good as those indoors. Each house, entered from the north, has a small gravelled yard behind a high iron fence and containing a shed. The shed inspected contained firewood, no longer needed when the central heating is completed, a bicycle and some old furniture. Garaging is provided in separate terraces alternating with the house-terraces. As observed in France on more than one occasion, some garages here are used for storage of old furniture, some of it of enviable quality and considerable antique value, but clearly having been displaced by the more modern though not more pleasant furniture the photographs from this and other Italian houses visited depict.

The gardens at the back of these houses vary in gardening standard. Coloured pictures taken are interesting to compare, showing as they do a certain range of treatment from the luscious to the simple. Flowers in bright colour were much in evidence and being easier to grow in profusion than is generally the case in more northern countries, are not in themselves evidence of keen gardening. But the family visited said that everyone was happy to have a garden and was sure that none would willingly exchange their terrace-house and garden for a flat.

It was noticed that planting had been done in most cases very sensibly, without over-complication and that ground cover was well-selected, usually of gravel or coloured ash. Not one garden in the whole group of over 100 houses was neglected and some were of outstanding quality. One had been fitted with a vine trellis, covering the whole garden. There were bunches of ripening grapes (the month was September) and a rich little harvest was soon to be gathered. This urban development retaining horticultural techniques, particularly that of the vineyard, seemed to have great significance for future Italian housing. Much Italian agriculture has a horticultural quality about it, not establishing the same kind of rural-urban contrast as that present in the other countries under consideration where large-scale farming in the countryside may be tending to inhibit horticulture in the towns, and so call instead for more communal gardening of the kind recorded in Denmark (see Chapter 5).

In the house visited neither the balcony at first floor level nor the verandah below it were much in use, but this was not the case in all the houses. In some were full length curtains shielding both the balcony and the room behind it from hot sunshine, and enabling the outdoor space thus protected to be used as an extension of the room.

To be distinguished from this is the custom almost universal in modern Italian housing of screening windows by means of roller shutters, replacing the old folding shutters. They are kept rolled down during the day except while housework is in progress in the room

concerned, but are rolled up in the evening when the sun has lost its strength. There is a middle adjustment used particularly on facades away from direct sunshine during the heat of the day, whereby the whole shutter, including the metal grooves in which it slides, is pushed outwards at sill level on two metal rods to form a kind of hood, like a shop sunblind. This allows for more air movement in the house.

(5) IVREA : INA-Casa HOUSING.

Two blocks of INA-Casa housing were inspected at Ivrea, at the entrance to the town from Milan. They are flats on seven floors with garages and laundry on the ground-floor, and the dwellings range from minimum flats for newly-weds to larger flats more on the scale of those seen in the Olivetti development.

This time one of the minimum flats was visited, inhabited by a young textile worker and his wife, as yet childless. The plan contains much that is characteristic of Italian housing and housing tradition. It has the generously scaled ingresso of the instituti period, and within its minimum number of rooms, a sense of space. Leading to it is a wide marble-clad entrance hall and staircase, the entrance hall having a pool and fountain to give coolness. The use of marble (still a cheap material in northern Italy) both for paving the hall and stairs and for the wall surfaces in these areas of public access (also as a flooring

finish in the houses) contributed to this cooling and soothing effect. The success of these tactics against the particular discomfort of the Italian climate was found to contrast with the general lack of any similarly serious attempt in the northern countries visited to produce warmth in entrance halls and public staircases, and so to deal with the corresponding but opposite characteristic of these parts of the Danish and the Scottish block of flats. There were exceptions, as noted in the chapters concerned with these countries.

This flat consisted of a soggiorno-pranzo, a minimum cucina and bagno, and a generous sal di letto matrimoniale. The plan had reduced the soggiorno-pranzo to the uncomfortably small size of 117 sq. ft. or 9 ft. by 13. But this balance of areas between soggiorno and matrimoniale seems to be what people want, and after many inspections of smaller Italian dwellings can be described as a typical approach to space provision, followed by typical space-use. For the latter, in terms of furnishing, the starting point is not the soggiorno-pranzo nor despite an observably high degree of cooking skill on the part of the housewife, the cucina, but the sal di letto matrimoniale. Its palatial furnishing and scale, as though part of some much larger and grander dwelling, are well brought out in the photograph. Not shown on the photograph but recorded on the plan is the outsize doll squatting in the centre of the counterpane, a fertility symbol of which this study produced other examples from the latin countries; and the large triple wardrobe and other pieces of furniture, with two armchairs;

last but not least, the fine wood-block floor. Similar scale was represented in the large sideboard in the soggiorno-pranzo, large enough to diminish quite seriously the space left for the dining table and chairs (5 persons) and to crowd into a corner the other furniture belonging to the prescribed sal di soggiorno usage of INA-Casa type plans (the sitting room seating) reduced in this case to one two-seater settee with wickerwork seat and back, facing the T. V. set at somewhat long range across the table.

The inconvenience of this pretentious soggiorno furnishing and its ill-considered scale, was emphasised by the wholly repetitious table and chairs for two persons, only a few feet away, which as seriously cramped the kitchen. As elsewhere this dual arrangement was aimed at providing separately for formal and informal meals, come what may. Informal meals, it was almost unnecessary to explain, consisted of husband and wife eating alone; formal ones when they had relatives to dine with them.

The kitchen equipment was of good quality. There was the usual sink-with-drainer of vitreous china, a gas cooker with three rings, grill and oven all under a ventilating hood, but no larder or refrigerator - a relic of older practice already reported.

The bathroom with bath, basin, W.C. and bidet contained (as at Poggibonsi) the electrically heated hot water cylinder placed over the bath in a position where heat-loss in pipe runs is reduced almost to nothing. There was a shower arrangement incorporated with the bath

taps. As in other Italian houses seen, and as in examples from other countries, clothes washing was in evidence in this bathroom. At the time of inspection (9 a.m.) the bath itself had just been used for a washing, with the scrubbing board still in position; the washed clothes were being hung out to dry on a framework extending from the bedroom balcony. When the writer arrived the house was in some disarray, as was expected and hoped to be discovered; yet it was so controllable that within minutes the degree of order the photographs show had been established. It was a race between housewife and camera.

(6) BRESSANONE, NEAR BERGAMO

In Chapter One reference was made to differences of geography and climate caused by altitude, so that, within the Alpine massif, although it all lies well to the south of the European area considered in this thesis as northern, housing displays characteristics more like those of northern countries. Alpine life, indeed, has qualities of its own, and these were inspected in the course of the present study along the route into Italy from the Great St. Bernard pass, where (near Bergamo) modern housing made to conform in some degree with Piedmontese and South Tyrolean Alpine tradition was examined. In many districts the seasonal movement of pastoralists with their herds dominates existence. They migrate in spring and summer to high pastures known locally as alp, alm,

alpage, or maiyen, which extend to the permanent snow-line at 8,000 or 9,000 feet, or, on the Italian side, 10,000 feet. This migration, known as transhumance, involves for those who take part in it two dwellings: the farm or shepherd's house on the lower slopes, where in winter the cattle are stall-fed and the folk live in modest comfort; and the grangia or shelter built on the high pasture where in summer a rougher existence is led. It is closely similar to the Norwegian saeter, which in the same way houses the Scandinavian pastoralist during his somewhat shorter season tending cattle in the high pasture or fjell which, so much further north, finishes lower: at 4,000 to 5,000 feet.

In the Tyrol and South Tyrol the pastoral life of the mountains has long been linked with the working of mines of salt or other minerals. The inhabitants of whole valleys are occupied in various branches of industry and the younger men travel far and wide as artisans. Such was the character of a household visited near Bergamo, where the father, a miner, was of a shepherd family; but the son was an industrial worker, bringing into the home (together with his wife who yearned for the cities) a flavour of urban civilisation. Of the life lived by the father in his youth in the grangia the writer saw nothing and could draw out little; but snatches of description from Freya Stark, who experienced it, give glimpses of its tough quality, also borne out by general observations which the writer made in the region of the St. Bernard passes themselves, not entering the buildings, but camping beside them. She writes of

that existence thus:

> ".... a night high above the Valdieri in a grangia, with shepherds. Their bed filled the inner half of the hut and room was made for me, the mother of the family sleeping between me and her husband and son . . . . . in the summer the people of the grangia set out at three o'clock in the moonlight to cut their hay, and return after dark".

This is the pattern of life there, with virtually only one meal taken, supper. Miss Stark observed that despite its rigour, the grangia existence is not without its complete little man-made environment set against an awesome grandeur of nature. She describes the old grangia village of Macugnaga, in Val Anzasca above Ivrea in simple but effective language. Behind the little community rises Monte Rosa

> "like a wave of perpendicular glacier above the open valley" . . . . . "A little church, grey with lichen, stands against its (mountain) background. The houses are chalets carved with a fretwork of hearts, crosses and other devices, with geraniums hanging from their balconies in long festoons. The meadows have clumps of roses, filled with sweet-smelling mountain hay."[37]

It is significant that even the grangia existence, temporary for most inhabitants of the upper slopes, centres on village communities in which a nucleus of hill-folk live all the year round, but also that the modern settlement which extends in the other direction and joins the mountain community to the industrial existence down the valley, has little of the social and architectural character of the old. Bressanone is a new development built to accommodate industrial workers and those

engaged in making hydro-electricity, great quantities of which are fed down the Alpine valleys by the national grid to Milan, Turin and the other manufacturing cities and towns of the Po. The dwellings are built to resemble Alpine farm houses, but are in fact two-storey blocks of flats. In the sample studied, occupied as described by a family of two generations, making two households, the plan of which an illustration is given, is used with emphasis on bedrooms. The only space used as a living room is the kitchen - it merits neither the word soggiorno nor pranzo. But here on a Sunday evening a large family group took its ease, and already numbering five - father and mother in their 50's, son and daughter-in-law in their 20's, and unmarried teenage daughter - entertained the writer and his family of five with no concern felt at lack of space by either party. This experience, like others from the same study tour, disposed the visitors to feel that an Italian skill in space-use exists by which many people fit into little space with no sense of confinement. Windows left wide open (see photograph) assist this. So does the fact that big armchairs, despite INA-Casa drawings of them, are, as in this case, non-existent. As noticed at Genazzano, in an old house, wooden chairs are usually enough and there is little urge to move them from a table on which stands bread and cheese and a fiasco larger than those seen by Schindler in his trattori and much cheaper. This kitchen was studied, measured and drawn, while we sat there, and the results are illustrated with the relevant descriptive notes. The cooker, a combination this time of

electrically heated hot plates and others heated by solid fuel, was drawn, as was the wash-up arrangement with its large (30 gallons) horizontally slung white-enamelled and excellently insulated cylinder placed over the bath in the bathroom adjacent. The daughter-in-law, whose excellent taste and education, better than that of the family she had married into, had led her to choose a high standard of furniture for her own room, proudly showed this with its letto matrimoniale. Being as yet a childless couple, the large doll in the midst of the bed had the same serious significance as that seen in the flat at Ivrea.

To serve the two flats contained in this house, there was one garage in the basement, evidently on the assumption that an average of car-ownership is fairly estimated at one car to the two households. This, having regard to signs that the occupants were not of a car-owning income group, seemed lavish.

(7) S. ROMUALDO, near RAVENNA

Despite the rapid progress with absorbing an increasing population by industrialisation, of which the development just described is an example taking place on the fringe between new industry and older agriculture which contained or accommodated some industrial activity, Italy remains a predominantly agricultural country and rural over-population a major problem. Consequently there is a scarcity of

agricultural land and nearly all of it is divided into small-holdings, many of them too small to support a family. More than one third are of less than 2½ acres, and only one third (not the same third) are owned by the people who work them. The situation is recognised to be full of social evils, but stopping short of large scale expropriation and redistribution, governments have been content with limited redistribution, chiefly in Sicily, Campania and Apulia, and with reclamation of marshes for parcelling-out into new holdings of a balanced size. This operation conducted by the Ministero Agricoltura e Foreste (Ministry of Agriculture and Forests), is combined with a general movement for reform of agricultural methods under an organisation called Inte Riforma Agraria which operates under a slogan known as the four R's: Rettitudine, Responsabilita, Ricerca, Ricompensa (rectitude, responsibility, research, reward).

The settlement of new holdings visited at S. Romualdo near Ravenna is an example of this combination, which has gathered there a group of young farmers interested in progressive agriculture and in a new community life for the countryside. Each holding is of 10 acres and contains a farmhouse with steading and at the centre of the group of holdings is a centro consisting of a church, presbytery, doctor's house, two schools, a medical clinic, a bar and billiard saloon and a village hall used also as a communal television theatre.

The church, owing something to S. Vitale in nearby Ravenna,

uses the central type of plan favoured by the movement for liturgical reform although the altar stands in a traditional sanctuary, and there is a free-standing campanile and also a separate baptistery. The schools are for infants (3 to 5) and juniors (6 to 12) and information volunteered by an administrative assistant from the Ministry was that a senior school would be added when there were enough children in the settlement over 12.

All these buildings form a group surrounding a piazza which comes to some degree of life not at the hour of siesta, but in the late evening and also on Sundays after Mass, when, as in every Italian village, the congregation adjourns to its secular refreshment over which to exchange sports news and gossip or talk politics. Communal television in the hall is then in full swing; so is the billiard room and there is a surgery hour in the clinic. To complete the picture, a trattori, at present missing, seems only necessary, perhaps, to a visitor; but for him this rural centre hardly caters. The furthest smallholding is no more than a mile distant and the Sunday midday meal at home is for these thrifty young country folk a solemn rite. Yet here is piazza-life to an extent covering their communal needs as these have been inherited or acquired. There is spacefor more buildings round the perimeter; time will tell what these may be.

Nothing quite like the S. Romualdo centre was found in the other countries. In Scotland, for instance, the smallholding system has been important in rural development under the Department of Agriculture

and Fisheries (see Chapter 8), but there have been no attempts to draw the smallholders into a community of their own and nothing built to compare with this and other similar Italian building groups. In Denmark the "husmand", as the smallholding farmer is called, fits into the existing rural pattern and his centre for religious and social life is in the nearest village, together with farmers of other income-groups. In France and in Bavaria the smallholdings visited were sited close to or within an existing village, with the same effect.

The smallholdings themselves at S. Romualdo compare favourably both with Scottish and Danish counterparts, house and barn being the elements provided by the organisation and then added to as means may be available as the holding prospers. In the sample holding visited there was a barn well stocked with grain in sacks, straw-bales to show that harvesting had been by the co-operatively held combine, a small herd of cattle including two bulls, a sow with a litter of pigs, poultry and an unidentified breed of rabbits being raised for their skins. The sow was in her own sty, added to the basic buildings so as to form the third side of a courtyard which normally has only two sides. There were two tractors and home-made trailer for transporting live-stock.

The house, of which a plan is given, shows a space-provision of cucina-pranzo and six other rooms, three used as bedrooms. The household consisted of man and wife and baby, and the man's mother and grandmother. Of the remaining three rooms, one is a spare room upstairs apparently unused but containing a few pieces of inherited

furniture which indicate that, in time, it is to become a child's room. One is a spare room downstairs for a hired man taken on at periods of peak activity, and the third is a work-room for such activities as plucking and dressing poultry. From the presence of a french window, and also the size and proportions of this work-room, it was deduced that the use intended by the architect must be that of soggiorno, but the occupants of this house had no idea of ever furnishing such a room. All their household functions except sleeping and ablutions took place in the kitchen. There the arrangement of furniture took advantage of a kitchen-recess neatly provided to separate the functions of cucina and pranzo, although a refrigerator was allowed to stand beside the side-board in the pranzo area, where it balanced the treadle-operated sewing machine to which reference has already been made. The side-board in this house was more functional than others seen but had its upper part glazed for the display of china and glassware, a use to which these occupants paid no attention; bottles, plates, jugs and other utilitarian objects filled the display space.

Bedroom furniture was clearly related to the ages of the occupants in their three generations. The smallholder and his wife had bought as lush modern furniture as they could afford, including a six-door wardrobe which was less than half-full of clothes. The smallholder's mother had her room furnished in what might be called a village-carpenter version of the ornate late 19th century. His grandmother had furniture of poorer origin from much longer ago, of an

utterly plain wooden kind which of all the furniture seemed most in spirit with the house. Wardrobes and chests of drawers were in all the bedrooms and on the upstairs landing stood a portable wash-stand on metal legs with a marble top, carrying basin and ewer. A wash-basin with hot and cold water was provided in a lavatory downstairs in which the W.C. was a vitreous china casting let into the floor, of the kind commonly seen in Italy with shaped foot-supports for excretion in a crouching position and a water-saving arrangement for a small flush and a bigger flush. Overhead was a shower nozzle using cold water only, harnessing water used in this way too to flush down the soil drain. This was the cleanest W.C. of the kind seen in Italy; there was no smell at all and although the photograph shows some staining, this was not over-offensive.

Hot water was heated by circulation from a solid fuel cooker standing in the kitchen recess under a canopy intended to draw cooking smells by gravity into a chimney, which also received the end of the metal flue-pipe coming from the top of the cooker. Electricity came to a meter above the cooker leading to a very sparing distribution system which nevertheless included two wasteful-looking hot plates standing nearby on a white-painted chest of drawers.

With their generous space but primitive services, these smallholders' dwellings are an example today of the first resolves of the Italian housing movement. Having also seen how in newer developments space tends to be reduced in favour of better services and more equipment, it might now be appropriate to take a look at the

balance of these conflicting factors in an example of a privately erected dwelling in which affluence and a consequent degree of luxury tend to resolve the conflict, but within certain confines, chiefly those of the site.

(8) CAPO S. MARTINO; ARENZANO: VILLA AND NEIGHBOURHOOD PIAZZA.

This is a villa designed by Vico Magistretti at the new residential suburb of Genoa, Arenzano Pineta at Capo S. Martino; as the name implies, it is built on a hilly pine-wooded site on a plot about 100 feet square. The villa follows the slope with five levels, of which the middle three create the main spaces: service space, subdivided into cucina, lavanderia, and guardaroba; living space, divided by a fireplace and chimney into soggiorno and pranzo, the latter dropped to the level of the service space; and the bedroom area, of which the camera di letto matrimoniale is open to the soggiorno though with a folding door across the terrace-like opening, while a guest bedroom is given conventional privacy. Between these two double bedrooms are two bathrooms, one with shower and one with bath, each having W.C., bidet and wash-basin. Separate from these three levels is an attic containing two single bedrooms for children and their bathroom, also equipped with a bidet. A staircase runs through the house connecting all five levels from basement to attic, but the three main levels have interconnecting steps independently.

The total floor area excluding garage is 2797 sq. ft., nearly three times the area of the largest of the Olivetti company's flats at Ivrea, and over twice that of the Ivrea terraces.

Furniture in this villa is a modern variety, ranging from Mies van der Rohe "Barcelona" settees in brown leather, to Aalto's laminated wood, with a few pieces of good Italian tradition. There is a certain provision of built-in storage, including the "fitted" kitchen which Italian publicly financed or subscribed housing has yet to provide. There is a complex service hatch and meals are taken only in the pranzo area. The cucina and soggiorno functions are therefore wholly separate and in this house the latter is provided for in a way careful to avoid any suggestion of work, unless it is the presence of books on shelves, but these are so well ordered as to suggest that their use is symbolic more than real, symbolic of an education already regarded as complete. So important is this soggiorno function that the pranzo table is collapsible in order that this area may lend its neighbouring area more space. Here is a reversal of the domination of the soggiorno area by a dining table too big for it, the common usage which in the light of this example has about it a quality of tyranny by a tradition, for this is a home where the owners and their architect have put the required space-provision through a prior test of space-use, and thus thrown off that kind of tyrannical influence.

It can be said, therefore, in this case, that space-provision, so far coinciding with space-use, and integrated with the provision of

equipment, results in a dwelling of balanced design, given no more than the number of occupants for whom it is planned and given a continuance of their habits.

(9) ARENZANO: THE CENTRE

The Arenzano development is an estate of villas for the well-to-do of a kind becoming common on the remaining unspoiled stretches of the Mediterranean coast of Italy north of Elba, and along the neighbouring Côte d'Azur of France. In the French chapter one such development, at Cap Camarat, is described. Arenzano, unlike Cap Camarat, goes in for low density development, the houses standing separate for the most part, but it shares the concept of a community, and to express this concept a centro has been created which is of some interest in view of what has been said earlier in the present chapter about piazzas.

The centro consists of low buildings enclosing three sides of a square, containing shops at ground floor level with flats for the shop-keepers above, and including a ristorante and bar. The fourth side is open to a view towards mountains. The concept is to create a meeting place, where the pleasure of meeting neighbours is enhanced by the presence of high-grade communal facilities.

Arenzano Pineta nevertheless suffers from the defects of the

dormitory suburb and the centro institutions suffer from having no life during the day, not even at siesta time. There is not much yet even by night, but this is an area where entry to sites is very select and the build-up of population slow. It has the look of a one-class society and although the ristorante is of a simple functional design in the modern idiom, as Peter Schindler's was in an older, the illustration given shows that it scarcely has the same appeal, and traversing the area it serves suggests that there is little prospect of the same rich mixture of human types being seen in it. It might be remarked too that the piazza plan is too geometrical, giving the place a sterile look which compares ill with the pregnancy of the scene Schindler describes.

(10) SIENA : AN OLDER MIDDLE-CLASS FLAT

As in other countries visited, Italy has its examples of older dwellings modernised which, both in their older form and in their modernised form, represent decent liveable space standards. Some are occupied by middle-class people with resources to maintain their property and carry out improvements. A case-study is appended of a top flat in this category on the fourth floor of a nineteenth century block built among mediaeval buildings in the Via Galluzza in Siena. The arrangement of rooms begins with the visible asset of a large balcony big enough and private enough to be an outdoor room, and it

is not surprising to find a kitchen and small living room opening from it, with the rest of the house devoted to bedrooms, more spacious than the living room but in their way less liveable. An interesting circulation of activities takes place between kitchen, balcony and living-room, centring on the kitchen, where the table, despite restricted space, is used for all meals. The divans in the living room are used as sofas, the only concession in the house to seated comfort, except for an armchair in one bedroom. Chairs are drawn out into the balcony for evening sitting and the balcony is also used for washing and drying clothes. Spaces at one end of it are used for the storage of coal and wood for firing the boiler which, from the entrance hall, heats the house and also the bathroom hot water in winter. Flowers growing in pots on the balcony provide a garden-like atmosphere and also a visual screen giving some privacy.

With its total floor area including the balcony of 1026 sq. ft., this four-room flat is not significantly more spacious than INA-Casa housing at Ivrea, a compliment to modern Italian space standards.

(11) FLORENCE: A MODERNISED VILLA WITH TOURIST ACCOMMODATION

All over Italy old buildings are in use as modern dwellings, and, though they may be less numerous in Italy than in the other countries,

this applies to villas as much as to any other type of dwelling. At Florence the villa Fasola, a seventeenth century building of no great architectural quality but considerable charm, was made the subject of a brief case-study. The plan is on two floors, the upper floor containing the living rooms, and now also the kitchen quarters, the lower floor containing the old kitchen, a garage, and a bathroom with one large bedroom and one smaller. On the upper floor is a common room large enough to contain a grand piano, a circular dining table with seats for 12, and also a group of armchairs around a smaller table.

The house is arranged for two scales of seasonal occupancy, winter and summer. Winter occupancy is confined to the projecting block which includes the bedroom and bathroom downstairs and the kitchen upstairs, where in winter meals are taken. In summer, the house is full of visitors and t he main part of the building is then taken into use. The old kitchen downstairs, mainly below ground level and having a vaulted ceiling, exists today as an extra dormitory for organised parties of visitors. This is the reason for the pile of beds shown stacked in one corner.

The use of the larger Italian house, whether villa or flat, as a summer <u>pension</u> is part of a middle-class Italian tradition extending back into the nineteenth century. All through the period of industrialisation and the rise of democratic government, which has also witnessed the development of housing for the workers, this has been an important financial support for neglected sections of the middle class, and one way

in which houses which are otherwise too large and too expensive can be maintained. When it is considered that during the half-year, April to September, the population of Florence, Siena and other much-visited Italian towns is on the average doubled, the continuance of this middle-class duality of accommodation is something which Italy must provide for, with or without official help.

(12) SIENA: A FLAT WITH TOURIST ACCOMMODATION

A similar but larger flat on the second floor of a nineteenth century building on the Via Socino, in the nineteenth century development outside the city walls of Siena, was also studied. This is a characteristic nineteenth century flat, with a central corridor, rather dark, with rooms opening to both sides. Modernisation has taken place in the bathroom, at one end of the corridor, and in the kitchen. Separate hot water cisterns have been provided, that for the kitchen being heated by gas cylinder while the bathroom was equipped with an immersion heater in a hot water cylinder suspended over the bath, a device similar to that seen in a new flat at Ivrea, as described.

This flat was large enough to contain two living rooms besides the kitchen, one of them furnished with comfortable chairs, a coffee table and a standard lamp, with piano and book cases, the other furnished as a dining room with the usual large central dining table and sideboards.

This room contained the television set and was found to be in full use by the family. They sat round the table all evening and it was noticed that the room with comfortable chairs next door was kept in dust sheets and said never to be used. The kitchen also contained a table, and meals were taken at either table according to the mood of the moment. The man of the house, a professional man, had a study for home work in connection with his business containing a divan for occasional use when the house was full of guests, as it customarily became every year during the tourist season.

(13) THE NEW TOWN OF GELA, SICILY

The final Italian case-study is of a project, drawn into this thesis because it seems to answer the social-architectural question of a union between modern space-provision rationale and the mystique of older Italian environments, the very things which draw to Italy the tourists about whom the last two case studies have been concerned. The project is Gela in Sicily, a new residential town for employees of the petrol combine ANIC, which is expected to reach a population of 9,000. This is to be a mixed development of tall blocks, lower blocks and patio-houses laid out in a town-planning idiom of rectangles with segregation of wheeled and pedestrian traffic, fitting into the kind of thinking done at Cumbernauld and at Livingston in Scotland and at the Albertslund and

Ringsted developments in Denmark. The tall blocks are arranged round a series of piazzas open only to pedestrians, joined by stairs which are introduced to make possible "a modern kind of modelling but bearing in mind nevertheless enthusiastically the idea of a town on the south-east coast of the island."[38]

The piazzas descend in an architectural cascade from high ground on a rocky cliff to a sand-banked river-mouth,and,besides keeping their sense of enclosure,command views along the coast over to the old town of Gela, likewise on high ground,two miles away. Besides the stair motif, so much in character with Italian and particularly Sicilian tradition, indeed making use of this motif, the design on paper promises to show exactly that variegation into nooks and corners the argument for which has been advanced earlier in this Chapter.

The patio-houses drawn have a strong resemblance to Jörn Utzon's in Helsingör (see Chapter 5) a notable instance of north and south exchanging ideas. This resemblance is both in respect of the shapes of the dwellings and their assembly into groups which, as at Helsingör but in a greater degree on a site offering greater opportunity for it, expose each dwelling to a magnificent view. This achievement, if it is realised as the drawings and models give promise, puts Gela into the category of advanced design represented in this thesis by the Cap Camarat scheme in France, the Schulze-Fielitz ideas which have emerged from the School of Architecture in Hanover (though these go further as regards advanced construction), the ideas advanced by

Professor Bredsdorf for Reykjavik, and those of Edinburgh University students for Livingston.

SUMMARY OF CONCLUSIONS FROM CASE STUDIES

Until combinations of privacy of living indoor and outdoor, combined with the enjoyment of views, are the subject of widespread study by town planners and architects outside Italy and within the Italian context, the likelihood appears to be that Italians, like other nationals interviewed in the course of the present study, will retain an ambition to own a villa, preferably standing in its own grounds and enjoying its own view. The case study of such a villa appended, at Arenzano, is one which achieves privacy and also a view. For every one which really achieves these conditions there would be hundreds which do not, if a statistical search were made. Yet it would be surprising if there were no widespread ambition in Italy to live in a villa, and to those householders visited in the course of the present study who were asked if they would not prefer a villa-type dwelling to their present abode - whichever it was - the answer was, not surprisingly, an invariable yes. And this answer cannot be pushed aside as being not really meant, however impossible it may seem ever to provide a villa per family throughout Italy. What people want is individuality and privacy, with adequate space, and to most the villa is the only type

to provide these things. It may be predicted with some confidence, based on the observation and scrutiny of present conditions among the Italian haves and have-nots made in the course of this study, that Italian space-provision policy must soon return at least to its earlier space standards and that in doing so, urged on by whatever information of consumer needs is gathered by Italians themselves, it will explore possibilities of increasing privacy indoors and out-of-doors, short of the villa conception of this quality but looking at least as far in that direction as the patio-house. It cannot but encounter the need to consider the pedestrian street and piazza, as at Gela, and explore too the possibility of the covered street, extending this, if possible, to the design of accesses to flatted dwellings as successfully begun in one case at Tuscolano.

These trends seem to be on the way already on a basis of what appears so far only to be general knowledge of needs on the part of Italian housing experts, with intelligent interpretation of some occupants' reactions to their present dwellings. But scientific method may soon be brought more to bear. The need to do so has been voiced many times, and this is inevitably one of the present study's conclusions, knowing that its random sampling can only suggest findings, not prove them, and they may need to be proved. An influential occasion for stressing the need for more scientific research was the Conference of the International Federation of Housing and Planning held at Perugia in September 1959 when Professor Ludovico Quaroni presented his paper on housing

for low-income families in Italy, from which this thesis has already quoted. His first criticism of the prevailing situation was the need for organised research:

> "La prima carenza e rappresentata mancanza di una valida legislazione, eventualmente articolato nelle regioni, per la ricerca dei dati essenziali ad un studio scientifico del problema . . . . nei riguardi delle aree, dei nuclei e dei tipi edilizi".
>
> (The primary need is the lack of viable legislation, perhaps enacted for regional application, for research for data essential to the study of the problem . . . . in regard to sites, services, nucleated centres and types of building).[39]

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2. Elizabeth Denby: Europe Rehoused. p. 186.

3. Christopher Hibbert: Benito Mussolini. p. 253

4. Margherita Sarpatti: Dux , p. 221.

5. Christopher Hibbert: Benito Mussolini. p. 74 et seq.

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7. Ibid. p. 223.

8. William Rademaeker, writing in Time, July 16th, 1965.

9. C. F. W. R. Gullick: Italian manners and customs, Chambers' Encyclopaedia Vol. VII p. 811.

10. Corrado Beguinot: Programmazione e Sviluppo. p. 149.

11. Freya Stark: Traveller's Prelude, p. 226.

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13. Morris West: Children of the Sun, pp. 18 - 26.

14. Ludovico Quaroni: L'Abitazione per le famiglia a basso reddito in Italia. Sect. 3.

15. Freya Stark: Traveller's Prelude; pp. 228 - 229.

16. Axel Munthe: Story of San Michele. No chapter or page reference can easily be quoted. The whole latter part of this northern European doctor's autobiography concerns his creation of an Italian home (for a man going blind) on an idyllic island. To a blind man it mattered to go and die in the warm southern sun.

17. Schwan: Stadtebau und Wohnungswesen der Welt, p. 227.

18. While doing the field work herein reported, the writer lived as nearly as possible to the Italian conditions being studied, buying and cooking food accordingly.

19. Morris West accuses Italian statistics in sharper (borrowed) language: "Figures! Figures! Figures! There were lies, damned lies and statistics, and they all told me less about the condition of this city than I could see with my own eyes." Children of the Sun, p. 36.

20. Pica; Nuova Architettura Italiana , pp. 382-389.

21. Pagani: Architettura Italiani Oggi, p. 24. Other sources give similar figures with minor variations.

22. Ibid. p. 1.

23. Ibid. p. 25. Pagani here is quoting the proceedings of the Congresso Nazionale della Ricostruzione Italiana held at Milan in December 1945. The quotations given are newly checked translations. The Ernesto Rogers theme is expanded in his Esperienza dell' architettura, Part 1c.

24. de Wolfe: The Italian Townscape, p. 129.

25. Ibid. p. 87.

26. Peter Schindler: Dage i Nord Italien, pp. 78 - 79.

27. Morris West: Children of the Sun, p. 30.

28. Professor Steen Ejler Rasmussen: Om at opleve Arkitektur, p. 67.

29. Pagani: Architettura Italiani Oggi, p. 26.

30. Urbanistica 31, p. 110.

31. Fascicolo I dell' INA-Casa 1949. The year shows how quickly the research officers concerned got down to work. The organisation had only just come into existence.

32. Freya Stark: Traveller's Prelude, Ch. 6.

33. Alberto Moravia: The Woman of Rome, Ch. 6.

34. Utilization of Space in Dwellings: p. 6.

35. Adalberto Libera: article in Casabella, p. 35. September-October 1955.

36. Pagani: Architettura Italiana Oggi pp. 252, 253

37. Freya Stark: Traveller's Prelude, p. 238.

38. Urbanistica 35: p. 91 (the point is not brought out in the official English summary).

39. Urbanistica 31. p. 109.

CHAPTER FIVE

DENMARK

DENMARK

Danish housing is admired for its successful balance of low cost and worthy construction, the good looks of its buildings and landscape, and - especially in recent years' rethinking of the investment basis of housing - its financial policy. But not much serious attention has been paid to its space provision, although, on the other hand, visiting experts have retained an impression of its space use, of neatly furnished rooms full of house pride. Through publicity given to Danish interior architecture generally, the same impression is shared by a wider category of people, members of the buying public, who have come to regard modern Danish furniture very highly. Their impression is probably one of carefully designed pieces where the last unnecessary inches or fractions of an inch of the overdone joinery of past ages have been cut away, of furniture - particularly storage furniture - where the air space itself round, above and behind the objects stored has been reduced to its rational minimum. And if underneath this impression of clever design in condensed space there is a sensation of all of it having happened within modest space standards in the number and sizes of rooms, this has been perhaps only another way of noticing that, on the whole, Danish space standards are in current practice and by tradition, unambitious. To make a simple comparison with Italy, there has been no strong tradition in Denmark to favour space for its own sake, nor any modern governmental force able to create such a

tradition, to drive the accepted standards of space in the direction of the generous, still less of the pretentious. Rasmussen has said "There is a quality about all Danish architecture which can only be described as a dislike of the pretentious. This might be thought to be a negative quality but it is one which is given positive expression in designs for buildings of every kind in which human needs and the human scale, rationally assessed and worked out in great detail on drawings, are the basis of everything".[1] The context of this utterance was an explanation of the scaled-down characteristics of the little Baroque honeymoon house, Liselund, on the island of Mön, built in 1792-95 for the young Lord-Lieutenant, Antoine de la Calmette, by Andreas Kirkerup, who was an exponent of a classicism liberated by a romantic sense of the informal and the human. Compared with much central European Baroque, not liberated in the same way, this miniature seemed to Rasmussen to challenge the whole concept of grandeur.

THE DANISH DOMESTIC TRADITION

To claim that space provision in modern Danish housing has reached its present standards entirely through study of human needs and the human scale, however, would be to read more into this Rasmussen dictum than it contains. These standards are set, as will be shown, by the course taken in Denmark by the industrial revolution and its population movement towards the cities. But once set in this way by social and economic factors outside the control of architects and their clients, necessity has proved the mother of an inventive and

analytical ability which, in turn, has developed dwelling types, room arrangements and furniture groups where human needs and the human scale are respected and accommodated, in a way analogous to the Liselund achievement. In fact, most Danish householders visited in the course of the present study felt that their space was cramped, and that more space rather than cleverer furniture and equipment was the first improvement they would look for in any new quarters to which they might move. At the same time it was observed that many of them were becoming involved in a current economic expansion which is affecting Danish life in general almost as much as that of West Germany and were not perhaps impartial judges of their own case. They would like now to spread themselves, a modern English idiom for which there is a literal equivalent in Danish, also conveying the meaning that there is money available to do it. Money has become available through the "credit explosion", as Danish economists call the present state of lending and borrowing.[2]

All this is a matter of history, with its roots quite far back, certainly reaching into the Baroque period, when Liselund was possibly the best of a number of excellent small Danish country houses which have set as important a standard for the country as did the hotels of Paris in France. They would have responded to a mood prevailing in Scotland in the period before the Hanoverians introduced an English Georgian scale of country houses and landscape, for the pre-Georgian laird's hoose is in its way the same scaled-down version of the grand manner. In Denmark such houses are called herregaarde

(lit. lord-yards) not far removed even linguistically from the Scottish expression. The fact, too, that gaard is the old generic term for every kind of house in Denmark, except city apartments and suburban villas, suggests that in the development of such dwellings lay the truly Danish answer to the demands for living space. Examples of the herregaard tradition have been studied, therefore, both as regards space-provision and its use, and some evidence collected of its influence on modern Danish furnishings. Such evidence starts, of course, with the fact that the publication in 1918 (by Aage Rafn, the neo-classicist, and others) of the Liselund Book, with its measured drawings of that building complete with furniture, and its case for believing that Kirkerup's whole design was worked out on systematic dimensioning and proportioning, coincided with the agitation which led to the creation of the chair in furniture design at the Royal Academy of Art, Copenhagen. From that year and out of those circumstances, the development of modern Danish interior design, with its regard both for the elegance of the herregaard tradition and the limitations of the modern city apartment, was a foregone conclusion.

The city apartment or flat appears in Denmark in quantity as a Copenhagen dwelling type after the second great fire of the 18th century, which occurred in 1795. Under the supervision of the city architect, J. H. Rawert, large parts of the central area were rebuilt with wide streets and new squares, on a town planning standard set by the famous Amalienborg layout of some 40 years earlier.

Externally, heights of storeys became uniform and facades well proportioned, with simple decorations. Internally, plans of apartments produced well-shaped rooms with oval or circular dining rooms in corners between the main block and a service block which extended rearwards over what had been garden ground. Both in its adoption at this time as a dwelling type, and in its detailed form, the apartment was a solution to a serious problem of space, for the city was growing fast; but because of its retention of earthwork fortifications on a line adopted a century earlier, expansion outwards was impossible. Denmark did not abandon this kind of military defence until late in the 19th century, when such earthworks were either torn down, as in the case of most of those at Copenhagen, or else the town was merely allowed to develop round them, as at Fredericia, the Jutland railway centre.

The memoirs of the anonymous managing director of a Copenhagen Insurance Company published in 1943 under the title Farmors Hus (lit. House of my Paternal Grandmother), contain an observant description of the Copenhagen apartment, its contents and its daily menage, at the end of the 19th century. A series of abridged quotations of a lengthy and closely detailed text makes a valuable starting point from which to explore the modern Danish interior, whether apartment or villa. The author uses the nom-de-plume, Soya.

> "Farmor's apartment was situated in one of the new quarters which sprang up in the '70s when the city's old ramparts were demolished. It was a pleasant, urban apartment, provided with all the modern comforts. True, it has gas instead of electric light

but electric light had not yet proved itself; it was controversial and dangerous to life. It was only found in places where people thoughtlessly ran after the latest thing. Nor were there flush toilets. Still there was gas and running water, and two elegant main stairways; and the two streets at the intersection of which the building stood, were broad open boulevards.

"The block was really three blocks built together. One looked out on a beautiful park - one of the parks the city had laid out to replace the old ramparts which had been torn down. The second faced a wide street. Each block had its own entrance and stairway. The third was in the rear of the other two. It began at block number two, and paralleled number one. To enter it one had to go through the vestibule and glass doors of number two, then out through another door at the foot of its main stairway, and across the court-yard. It was always called the "garden House", with no other authority than Farmor's and God's, for there wasn't a spear of green near it except the moss which grew between the cobblestones.

"The three blocks had been carefully classified; number one was the finest. It was the one with the corner window. Still it was not so fine that the occupants of number one and number two could not associate; number three on the other hand ranked below the others.

"But now I open the door and walk into the apartment, which is composed of four rooms all in a row; all with windows looking out on to the street. Besides these there are a vestibule, a corridor, a study, a kitchen and a maid's room. Farthest in is the bedroom, soveværelset, a little room with a bay-window.

"As I enter, I experience discomfort - my sense of smell has caught a sour odor, such as meets one so often in old people's sleeping-rooms. Here everything is as it should be: a bed, a wardrobe, a washstand, a night-table and a medicine chest. All the woodwork is painted brown to resemble mahogany. The bed is short and broad and it bulges with its heavy down quilt which in the day-time is hidden under a white, crocheted bed-spread. The head-board is unusually high. Farmor does not sleep lying down but sitting up. The night-table stands next to the bed, a little in front of the head-board. On its marble top, in plain view, are: a low candlestick; a

> milky-white carafe with an upturned glass over its neck; a table-clock; a couple of medicine bottles and pill-boxes; an expectoration cup and a Bible. I am doubtful if Farmor ever read the Bible. At any rate I never saw her do so. On the other hand she certainly couldn't have dispensed with the round white vessel with a handle enthroned in the little table's interior, standing on a mat of white paper with a lace-like edge."

Soya tells his readers elsewhere that his grandmother came to Copenhagen from the country. That explains her upright sleeping posture and short bed. It also explains the presence of the Bible, but at the same time arouses doubts whether Soya is being fair to her in suggesting that she never read it. His description of the bedroom continues:

> "The wash-stand is topped with an icy-cold marble slab, and shelves rise from the back of it. The wash-bowl and jug lord it over the stand, bulging out as if they were pregnant. False hair is hidden in the drawer underneath as are a razor and a set of extra teeth.
>
> "The big medicine-chest also holds secrets. But for me they are not secrets. With a child's all-embracing curiosity, I rummaged through it whenever Farmor went to town. Here are to be found remedies for coughs, bronchitis, asthma, rheumatism, insomnia, nerves. There are also corn-plasters, adhesive tape, linen bandages, pieces of guttapercha, cottonwool, an ear syringe, a medicine-dropper and an eye-cup, a bottle of Brama's Elixir of Life, a box of Keating's throat lozenges and another of Dr. William's pink pills for curing arthritis, rheumatism and all kinds of stomach ailments.
>
> "The dining-room, spisestuen, is the largest of the rooms. In the centre the oval table stands. It is the kind that can be extended for guests. When she has guests Farmor always has the stove heated so high that the door in front of the grill goes red. The result is that guests who sit near the stove gasp as if

> in hell while those sitting at the other end of the room shiver with cold thanks to the draughts from the study and the sitting room."

Danes regard this passage as an exaggeration of stove-heated conditions. The stove, burning coke, was not inefficient. Soya mentions it with the other furniture:

> "The cylindrical iron stove is set in a niche. Along the walls are a red divan; a buffet; a sofa, upholstered in the same material as the divan; and, on the other side, Farmor's sewing-table and wicker chair and an armchair which stands between two windows. The wood-work is painted to resemble oak; the walls are Pompeian-red. The most elegant object on the buffet is a copper tea-urn.
>
> "Farmor sits as comfortable as ever in the wicker chair. Every time I evoke her in my imagination I see her sitting there with her expectoration cup and the open sewing-basket before her; with a piece of knitting or crocheting in her hands; with the canary's cage in the window and the reflecting street-mirror outside."

These mirrors, like driving mirrors on cars, gave the occupants of front rooms a view up and down the street without having to move out of their sewing chairs in the window recess. On upper floors the mirrors were angled downwards at the angle judged to produce the most interesting view. Soya continues:

> "The dining-room ... A misnomer. Of course we eat in the dining-room, but a thousand other activities take place also. Farmor sews here, reads her newspaper, takes her afternoon nap, and here also she receives visitors. To me the dining-room is play-room and sleeping-room. Here Johanne mends my clothes, the maid irons and folds the sheets and polishes the silver and the copper. It is the room in which we live during the winter; the only room which is heated, unless Farmor gives a party.

"Next to the dining-room is a little cabinet or study which has only one window. Nevertheless it has three doors, of which two are double: the first is a folding-door into the dining-room, the one by which I have just entered; the second leads into the sitting-room, and the third, a little single door, connects with the hall.

"The study or den is used when Farmor collects her tenants' rent. Then she sits at a little writing-desk with her cashbox in front, receives their money, gives change, and hands out receipts. It has also another function. When Farmor has company, the card-table is set up there - the lords of creation can only be entertained with whist or l'hombre.

"The room bears the imprint of its use. It has but little furniture: the desk and two chairs, one for Farmor and one for the tenant; a pedestal with a palm; a mahogany folding card-table which is pushed up against the wall. And there is also a corner what-not with Thorvaldsen's Christ on the top-most shelf, and a collection of porcelain dogs on the other shelves.

"The last room is the "every-day-room," dagligstuen. Its shape is somewhat irregular. The floor is a square but two opposite corners have been cut across diagonally. There are three windows and two doors. One window looks out over the park, another is in one of the two obtuse corners and has a view of a church and a hospital, while the third looks down the asphalted avenue and the tramway. The doors are, one, a folding-door into the den, the other a single door which is in the other obtuse corner of the room diagonally across from the window, and opens into the hall.

"The round walnut table fills a large part of the room. Farmor is very proud of the table-top which is inlaid with many different kinds of wood in various designs. Unfortunately one sees hardly anything of her source of pride because it only comes to view during the semi-annual house-cleaning. Every day and on company's days it is hidden, covered by a lacy doyley, a couple of photograph-albums, a receptacle for visiting-cards, four or five glass and china bowls, and twenty to thirty framed photographs.

"Six or seven chairs stand about the room, besides the sofa, all in red plush, and with tassels below the arms and seats. The every-day room is the only place in the house where the chairs are comfortable, with perhaps the exception of the wicker-chair and the armchair in the dining-room, but here they are, in contrast, luxurious. They are almost enervating, almost suffocating. It is especially true of the two "lady-chairs" in which the seat is especially low and close to the floor, and the back slopes dangerously backward. It was seldom that anyone sat in them, least of all women. There were still many people in those days who thought that a woman of good family and with self-respect should sit so erect that she never touched the chair-back.

"But the tassels! They characterize a whole era of culture. I used to call them "ringers", which was my own private appellation for bells, for they were in a sense a kind of bell. When one pushed them and then listened carefully, one could really hear them tinkle, ring in different tones - just like sleigh-bells. It was amusing, too, to push a number of them at the same time, so that they all swung, each in its own way; or, what was still more fun, to get the whole set moving with a single push of the finger. If one tassel stopped swinging, one had lost. What it was one had lost, I don't know, but the skill required to set them all going at once was not so slight."

Soya does not add that these tassels gave a name to the whole late 19th century manner of decoration: in Danish they are called klunker and the manner of decoration klunkestil. This gives force to the nickname funkistil applied in Denmark to Bauhaus functionalism. It tends also to reduce the use of the Austrian expression Biedermeyer in Denmark, though indeed klunkestil is distinct from that style in certain respects. He continues:

"Between the windows there are two tall mirrors, framed in walnut, almost reaching from floor to ceiling. Beneath the mirrors are marble console-tables, and on one of them is an atomizer with an absinth-green stopper. A book-case stands against one wall. It has glass doors and can be locked: mostly Collected Works are there.

"I turn towards the albums on the walnut table. They are two fat books, bound in leather and decorated with gilt edges and metal clasps. Both volumes are covered with imitation leather, but the style of each differs: the one is "rococo" and the other is "renaissance". The albums are what is called "insert albums". Here are inserted large and small photographs of long since deceased men and women, respectable, dignified citizens whose names I am for the most part unable to recall.

"A visiting-card receptacle lords it over the centre of the table. It has a metal stand on which rests a dark green porcelain bowl in the shape of an oversized figleaf. I rummage a little in the bowl; it contains the visiting cards of distinguished guests; some photographs of members of the royal family, with royal autographs; a ball of yarn, with knitting-needles stuck in it; and a spectacle-case containing glasses which Farmor can no longer see through. To tell the truth, Farmor never received any photographs from royal personages herself. They are only some that she had wheedled out of her son, Dr. Viggo Jensen, dentist by appointment to the royal household. But Farmor is reticent on this point.

"Every-day-room" is a still more unreasonable name than "dining-room". The room so called is actually only used three, four or five times a year when Farmor has important guests. At other times it is an ice-box into which the house's inmates only enter for cleaning purposes.

"Despite its infrequent use, Farmor wouldn't have done without it for anything. It is what lends one position and prestige. It is what distinguishes one from the lower classes, those who have only a dining-room and a bedroom, if they have even that much!

"Just opposite the door to the dining room there is a door which opens on a corridor, a little prison-like hole without light of any kind. In spite of its limited space, four doors open on it. One of them - the one I have just come through - is to the dining room; that on my left leads into a bedroom;

> the one on the right, to the kitchen; and the one in front of me, to the dwelling's most private room of all.
>
> "Here right in front of me is the room's most important object, the toilet with a cover on it. As the seat is high and Farmor is small, a wooden footstool stands in front of it. Next to it is a wooden box, which looks like a coal-scuttle lying on its side. The likeness is enhanced because the handle of a shovel sticks out of the open end of the container. But if one looks closer, it turns out to be a bucket containing not coal, but sawdust. The idea is that the user of the toilet is supposed to sprinkle sawdust after his use of the thing. But not too much - sawdust costs money, a fact which Farmor is accustomed to impress on every new maid. Two bundles of paper hang on the wall, each on its own metal. One bundle consists of pieces of newspaper, and bags from the bakery. The first is for the use of the maid; the other for Farmor and her guests. The pieces of both bundles are cut into nice neat squares.
>
> "Permit me to close the door quickly. Farmor would have died of mortification if she had read this description; and even my parents would have thought me tactless. A toilet is essential, but of course nothing anyone talks about. Even if one must go there, one must not let it be apparent. One says, for example, that one must go to the kitchen for a glass of water. And if the place has to be mentioned at all, then it can only be paraphrased: "the little room" or "the retiring-room". The smell of the place frequently came into the other rooms but never its name."

Had Soya been comparing countries, he might have remarked that even that unpleasantness was much to be preferred to the Italian arrangement of the tazza; yet that is to compare a middle class usage with one forced upon a more helpless social stratum. He continues:

> "The kitchen is small and looks onto the court. It has three doors: one to the corridor, one to the maid's room, and one to the kitchen-stairs. The wall facing the court has three connecting windows. On the same wall as the windows are the kitchen-table, a built-in affair; a cupboard; a sink; and a pump. The kitchen stove protrudes from the opposite wall - a fine range which burns both wood and coal - a stove with an immense number of tinkling iron rings, with a water-boiler in the

rear, with shiny copper kettles, and an always newly polished brass railing round it.

"The larder is also there - one might think it was a safe deposit, so well locked is it kept! When Farmor wants to get some article of food out of it, it is a very long process. First she goes to the cabinet adjoining the diningroom. There she lifts her skirt, and a red petticoat comes to view. This is also lifted, and still another is seen, matching the first. But in skirt number two there is a pocket in which rests a bunch of keys. With the aid of one of these, she unlocks a drawer in her desk, and from here she takes another key, a key to which is attached a little wooden label. Then she locks up the desk drawer, puts the bunch of keys in her petticoat number two, and trips back to the kitchen. The key with the wooden label is for the larder. When she has brought out the food, the same procedure ensues, but in reverse order. It is tiresome, but necessary. Nobody knows how much a maid would stuff herself with if she had free access to the larder.

"For practical reasons, however, Farmor keeps certain things constantly in the open; for example, the sugar-bowl, the tea-caddy, the cake platter, the butter-jar, and the cruet-stand. But these are kept in the dining room, inside the buffet, on which Farmor keeps a vigilant eye from her wicker chair in the window.

"The maid's room is the smallest of any in the apartment. Indeed it can hardly be called a room. There is an iron bed which lacks a leg; a rusty stove which is never lit and a wash-stand; a flowered, rust-stained curtain in one corner provides a wardrobe... If the maid brings a wooden chest - and in those days it constituted her trunk - the bed and chest would have to stand so close together that one had to crawl on to the bed to get past. There is no chair either in the maid's room or in the kitchen."[3]

Though the names of the people in Soya's Memoirs are not given, their types are readily identifiable and with the case study material is included a page of illustrations of a set of rooms from an apartment in Copenhagen of similar date. This is a richer and less cheese-paring ménage and the rooms are not for show, but were

really lived in until 1963, by an old lady of the next, and more liberal generation. The every-day room, dagligstue, in this example, extends into a music room containing a fine German concert grand piano. Controlled by a more educated taste, tassels are not so much in evidence. Some of this quality is evident in Soya's description of Mrs and Miss Tychsen's apartment, Farmor's tenants, impoverished, but living in surroundings of a higher cultural level than Farmor's.

> "Perhaps the apartment was smaller, but the furniture was more elegant and the cosy atmosphere was promoted by three things in particular. The first was the carpets. At Miss Tychsen's there was a carpet in every room. They stretched, thick and soft, from wall to wall. At Farmor's there was a carpet only in the dagligstue. . . in the dining room only a dreary, cold linoleum. Secondly, the furniture. Mrs and Miss Tychsen's not only bore the mark of a higher cultural level than Farmor's, but the tables, chairs, screens, pedestals and whatnots were grouped . . . . . and there were more pictures.
>
> "And finally, the potted plants. Mrs and Miss Tychsen had a great many more potted plants than Farmor. Not only were there window-cills filled with them; from the window-frames and the fretwork on either side it was as if a shining green light poured down . . . . the glass-doors of the bookcase reflected the sky and the potted plants."[4]

Here is part of the origin of the indoor plant culture for which Danish interiors were known internationally in the years following World War II, when the Scandinavian-modern style, so-called, was in vogue. The urge may well have been the wish to escape from town to country, as exemplified by the traditional

skovtur, (lit. walk-in-the-woods) with which late 19th century Copenhagen repaired its city-jaded health on Sunday afternoons. The North Zealand woods and lakes began, as they still do, at the suburbs, and in one, the Royal Deer Park at Klampenborg, there were special arrangements for public access, with cafes and little picnic places. A photograph of Copenhagen people of Farmor's time engaged on a skovtur is included with the case study material.

But the real escape was the villa, which had its origin in the same circumstances which produced Farmor's apartment block, when in the 1870's the military restrictions on building outside the earthworks on land kept clear for cannon-shot were lifted. Villa developments were planned on part of this land, the earliest and best being Rosenvanget (lit. The Rosegarden). It was built as a precinct northeast of the East Gate (Osterport) in 1857, with J. D. Herholdt, the leading architect of the romantic revival at this time, commissioned to design some of the villas, standing in tree-enclosed gardens with winding sylvan paths,

Rosenvanget was preceded in 1853 by a significant development of another kind, Lägeforeningens Boliger, (Medical Association Dwellings), also northeast of the city, built likewise as a precinct by Gottlieb Bindesböll, the architect of the neo-Greek Thorvaldsen's Museum. It consisted of cheap flatted dwellings placed in long blocks with enough distance between to accommodate small gardens and certain communal facilities. Greatly assisted by Bindesböll's "handsome, uninhibited design and execution,"[5]

this scheme was a practical demonstration by the medical profession of the kind of housing which would discourage cholera and other diseases of the big city, epidemics of which had scourged the tightly-packed flatted streets within the walls with successive disastrous attacks. In the case of the villas, the purpose was to seek out a healthful existence in a wider sense, to commune with nature, to indulge the poetic enjoyment of the beauty of trees and flowers. Later villa developments, reaching out northwards to engulf the fishing villages of Hellerup and Charlottenlund, had a less emphatic community sense about them, but displayed rapid advances in interior design. Of one such, at Katrinevej 3, Hellerup, a photograph of an "every-day-room" (dagligstue) in its original occupancy has been found and is reproduced. This was a villa built speculatively and bought by the secretary of a Copenhagen-based welfare organisation who appears on the photograph. He had brought up a family of three in a city flat and his chance to move came when, in 1898, his two sons emigrated to England and left him with improved means and reduced space needs. At Hellerup he was near enough to the city, 2½ miles, to cycle to work and not only could he enjoy his villa and garden but he could also indulge his taste for yachting, from the little fishing harbour at nearby Charlottenlund. The photograph shows the modern Danish living room in embryo: the selected furniture with its sense of comfort, both for use in summer, when the light streams in through big garden windows, one of them a "French" window for direct access, and for the winter

darkness, when the coke stove in the corner brings the whole room to a high temperature and the oil lamp glows on its table in the centre of the room. The table and the lamp are the focus in winter, not the stove. In summer the window and a view of trees and shrubs - these rather than flowers - takes its place, and with the window open the terrace outside forms a sitting-out space. This space use is illustrated with a photograph of the similar terrace at a neighbouring villa in use by well dressed women listening to gramophone music. In both villas, the every-day-room is really used as such, unlike Farmor's.

The corresponding winter scene is well portrayed by the cartoonist Frits Jürgensen in a drawing from his published collection, also included with the case study material. It shows the whole of a Danish family of three generations gathered round the table and lamp while the most literate member, a student son, reads aloud.[6] Coupled with the trend to use the dagligstue every day is the curiously inconsequential change in its name. It is now known as the opholdsstue (lit. room-where-you-stay).

All three types of dwelling have their counterpart or derivatives today. The city apartment, not without influence from the villa, has become the modern flat complete with bathroom and central heating, and its relation, however indirect, to green open spaces which has been developing steadily as a layout feature since Rosenvænget and the Lægeforeningens Boliger first demonstrated the pleasant and healthgiving possibilities of open space planned in relation to dwellings. The terrace house has

proceeded by stages until it reaches the varieties known in Denmark by the picturesquely descriptive names of row-houses, chain-houses, comb-houses and finally the patio-house of the current decade. These in turn have their own variety such as twig-houses (Grenhuse)which form a case study examined in detail. The villa remains the villa, still the preferred house-type. Case studies suggest that it contains within its own development and that of its site plan at the hands of six or seven generations of architects sufficient justification for this preference.

Designed like its prototype at Katrinevej for living in the rhythm of the seasons in their northern European contrast of long cold winter and short hot summer, the Danish villa seems to have reached a standard of development not generally reached in the other countries visited, and it is significant that some of the best examples of space-provision coinciding with space use, the one not straining the other, have been found in examination of this house type in Danish hands. Many recent villas are also patio-houses, though not obliged by density pressure to adopt such an arrangement. In this we may allow ourselves to see an absorption of southern Europe ideas made possible by modern methods of heating and insulation whereby the French window of 1870 becomes the sliding glass wall, triple-glazed and tightly closing, of a century later. The patio villa examined in this study is one designed for himself by an Aarhus architect, Knud Friis, in

1961, and it is not without interest that this 20th century dwelling, built too for newly weds, incorporates much of the feeling for space arrangement, which, in a different idiom distinguishes Liselund. Here, then, is the modern representative of the Herregaard tradition, or, at least, of its union with that of the villa.

Rosenvänget and the Lägeforeningens Boliger were for the middle class and the working class respectively. Concern felt for both classes' urban living conditions began to take effect through legislation soon after the political change from absolutism to parliamentary monarchy which occurred peacefully in 1849. Building Acts of 1856 and 1858 laid down regulations for street widths and space about buildings, not yet dealing with interiors, and only in a general way with sanitation; but already in 1865 the first building association, Arbejdernes Byggeforening (Workers' Building Association) was founded and had directed attention to the special problems of housing the lower income-groups. Much of what is now considered slumland, including the notorious Vesterbro area of Copenhagen, resulted from efforts made to solve these by repetitive building on minimum space-standards inside, similarly with maximum plot-ratios, and again with minimum street-widths and open space. These flats were unlike Farmor's. They were of one or two rooms, plus a tiny kitchen and with a toilet shared between two flats opening from the winding back stair. Two stairs were necessary as a fire

precaution, since both were built of wood. Idealism played little part, but, like the German mietskaserne, to be discussed in Chapter 6, there was constructional sense. Conditions as regards water-supply and water-borne sewerage were vast improvements upon the earlier use of water-points in the streets themselves and upon privies like Farmor's but of variously horrible kinds in back-yards and outbuildings from which the nattevogn (night-wagon), a fearfully insanitary wooden tank on wheels, removed the contents to dumps outside the city.

THE AWAKENING SOCIAL CONSCIENCE

The development of Copenhagen housing from the fire of 1795 to the Lägeforeningens Boliger in 1853 was served by architects, well educated men who had been through the architectural school of the Royal Academy of Fine Arts. But the latter part of the 19th century witnessed a change. Architects tended to concentrate on commissions for monumental buildings and to leave housing to building contractors. It was not understood that new cheap building methods and new materials, such as iron, faience and various components made with the help of steam-driven machinery, called for a skill in design no less but rather greater than the traditional construction problems of churches, museums and other expensive public buildings demanded. With the exception of one pioneer of the socially-conscious architecture of the next century, Alfred Raavad, who in the 1880's began a long career with some significant work

in the field of housing, it was not until the years following the turn of the century that Danish architecture showed an interest in ordinary houses and housing blocks. They were helped towards this by the awakening of a general interest in Danish folk tradition, including house-building tradition. This, in turn, had been caused by the democratisation of society and the growing concern for the ordinary man, den jævne mand, known by this term from the works of N.F.S. Grundtvig, who with others pressed such social concern the hardest.[7] The architect most identified with this trend was Ulrik Plesner, and to him the modern Danish apartment owes much. His flats at Vodroffsvej begun in 1906, were sun-orientated with alternating bay windows and balconies, and in a contemporary neighbouring scheme at Mariendalsvej he broke with the traditional block arrangement by running his buildings in parallel blocks, one of the first architects in Europe to do this, and considerably earlier than Gropius. But in the midst of a current onslaught of neo-classicism about facades, chances were lost to develop Plesner's free approach to facade design and his willingness to allow the form and space-arrangement of each room to determine its fenestration. A major event, not affected by this trend, was the building of Denmark's first terrace-houses of this century, Bakkehusene, in 1922, reviving a provincial house-type of which the 18th and the 19th centuries produced numerous examples. It was well enough

known too in the city from one of Europe's famous early examples, the Nyboder (lit. new-dwellings) development, laid out in parallel streets with tiny courtyard gardens behind by King Christian IV in 1630 for the personnel of his revived Royal Danish Navy. In their way, they are as important a landmark in housing history as the Fuggerei in Augsburg. At Bakkehusene the architect, Thorkild Henningsen, was convinced he had found the right dwelling for the common man and was disappointed when the common man showed little interest in it. From interviews undertaken in the course of the present study it seems that the terrace house and its variants continue to appeal most to the intellectually advanced, though the general appeal is now sufficient to quell earlier resistance.

Meanwhile the contents of each apartment block were becoming more complex. In the 1890's the communal wash-house appeared. Generally its place was in the basement and to begin with it was furnished with the most primitive equipment although a boiler was provided to make hot water and to boil linen. Tenants each had their own wash-day, usually once a month, when the operation was called storvask (big wash) as distinct from the smaller scale operation possible to perform in the kitchen sink or the bath from day to day. They brought their own fuel, wood or coke, to fire the boiler. Each household had its fuel store in the basement and in the

attic it had a pad-locked little pulterkammer, where furniture not in use could be stored together with trunks and suitcases. When in later times steep roofs came back into fashion this storage space among the rafters became generous. The basement also contained a bicycle cellar, an institution for which necessity arose just before 1900 with the import of English and German bicycles on an enormous scale.

The arrival of the bicycle age transformed the streets of Danish towns and cities from pedestrian and horse-traffic ways into fast bicycle routes under a police control as strict as anything now encountered in the motor age. It was a transformation as great in its way as that which took place more recently, largely after World War II, when the bicycle gave way to the motorised vehicle. Each invention led to the spread of urban development, to the use of more land for each housing group, since distance between work and residence ceased to have its former significance, and supported the trend to move away from high density closely-packed building of every kind except the offices of the central city districts. Bicycle cellars are still provided, but on a lesser scale. Garaging, in turn, has become a problem today, as in the other countries visited. Yet this problem is substantially lessened by the obvious urge which possession of a car supplies to get out of apartment-house life and build a suburban villa with its garage included, as it seems invariably now to be, whether at the villa itself or in a nearby compound.

The laundry cellar has undergone big changes. Not only has

more equipment been added but there are developments where a completely equipped industrial laundry is included in the complex of buildings, with a salaried laundress to help tenants to operate the machines. The future of this trend, not so pronounced in the other countries studied, is not clear. As noted in France in the case-study of the Nantes unité in Chapter 7, much will depend on the incidence of domestic machines as part of householders' own possessions. Sales-drives led by importers of British, German and Swedish washing machines, and joined by Danish manufacturers who have entered this field of domestic equipment, seem to be persuading the Danish housewife, like her French counterpart, that it is more convenient to wash in small quantities daily inside her own dwelling. A communal laundry, part of a residential group erected in Aarhus in 1961, was studied and is illustrated with the case-study material; it was found to be in only spasmodic use and the Danish housewives' remarks correspond with those recorded at Nantes: they do not really enjoy working in the laundry, nor is it the place where they want to meet other women.

For the middle-classes the 19th century apartment block at its best provided space conditions not far behind those of the villa and it did so a good deal more cheaply, for skill in the construction of four and five-storey structures was developing fast and sites for apartment blocks were not difficult to get. For the working classes space was always too constrained, but in 1914 all except 6.7% of Danish families lived in something better than the single-room flat which it had been the particular objective of the best 19th century

effort to eliminate, and only 1% lived in basements.

In Scotland in 1911, near enough for comparison, the corresponding figures were 12. 8% and 5%. Thus even within northern Europe Denmark entered the period of the great 20th century re-housing effort in a distinctly advantageous position. Were reliable figures available for Italy, it is safe to assume that they would have revealed a worse situation than confronted either of these northern countries at that time.

HOUSING AFTER WORLD WAR I.

The rush of residential development that followed World War I, supported by the Government Housing Fund through the housing associations and credit institutions, was put into the hands of architects, and some with famous names took a leading part in formulating the characteristic Danish housing block of that time, notably the late Professor Kay Fisker. This type of block was perhaps more notable for its exterior than for its interior planning which, with the exception of its provision of one W. C. per dwelling, replacing the shared toilet, remained largely as it had been in good 19th century practice. Thus, where that century in its concluding years had developed a certain rationality in street design and in improving the space given to back-yards, the first contribution of the new century was towards a different kind of site planning which since then has taken its grip of housing design all over the world: open development in depth. Ulrik Plesner managed to make this change in one complete move. His followers had to do it by steps. The

first step was to enlarge the individual block so that back-yards acquired enough area to allow a green open space to be made in the centre instead of a paved area. Classens Have is the best example, where an old garden was included in a surrounding development to form a ready-made centre-piece. The next was to omit some of the southern perimeter of such a block and so to let more sunshine into the central space. This we see at the development called Rosengaard in the Frederiksberg part of Copenhagen. Thereafter it was a short step to Plesner's form of layout, already being used under Bauhaus influence in Germany, and to set the blocks in parallel lines all facing the sun, with garden strips and access roads and paths between. This received impetus from the Weissenhof Exhibition of 1927, which advanced architects in Denmark considered a success, while noting its deficiencies, as described in Chapter 6. The first notable example in Denmark was the middle-class group at Hellerup called Blidahparken. Three-storey walk-up blocks were placed in parallel lines running east and west in an old garden, preserving a large number of fine mature trees, and the pattern of narrow access roads was treated as wholly subordinate to the plan of the blocks. The architectural idiom was gradually advancing too. Whereas the work of the early 1920's retained the romanticism of Nyrop's time, with stylisms at least 30 years old, Blidah partakes delicately of the new stylisms. The introduction of protruding balconies provides an opportunity for a visual play of cubist forms along the facades while adding usefully to the living space of each little apartment.

Contrary to what is widely believed, these balconies were not in the first place an attempt to provide an outdoor room. They were and still are primarily a fire-precaution: the price paid by architect and client, under a Fire Regulation passed in 1929, for being allowed to serve each apartment with only one stair; but architects were as quick to grip this chance to enliven their facades as were the tenants to use the outdoor space provided, for sunning the baby, for sitting-out after the evening meal in summer, or simply for clothes-drying and the airing of bedding. Such space-use raised, in turn, the problem of privacy, which was brilliantly solved by Paul Baumann in his great essay of 1935, Storgaarden, where each balcony was given a vertical shield to screen it from its neighbour. With no tall buildings opposite, each of his apartments thus obtained a tiny (6 ft × 3 ft) but effective outdoor room which at the time was much prized and used by the whole family of occupants. Those were the days before television, and also before the general ownership of motor cycles and cars took people singly or in families further afield when they wanted fresh air. These technological developments have tended to lessen the use of balconies as outdoor rooms. Similarly, the washing machine has lessened the time during which clothes hung out to dry are visible on balconies, for the common makes deliver the clean clothes drip-dry, and the best makes, as in other countries, completely dry.

Baumann's idea of balconies extending beyond the frontage was much copied, but it escaped general notice that the success of

Storgaarden lay just as much in the fact that this great block was not overlooked by other buildings of comparable scale. On less fortunate sites Baumann's method created problems of exposure to the curiosity of people living in blocks opposite. The method was then tried of sinking the balcony into the house, a return to Plesner's idea. At the same time narrow frontages which for economic reasons were insisted upon by the housing association managements led to a system of facade design in which recessed balconies alternated with projecting oriels. This corrugated treatment proved to be excellent. It provided in effect a longer external wall within the width of frontage, a wall along which more things could happen, and at the same time gave to the building a broad simplicity of form. To the tenant it conveyed a sense that his flat had a greater variety of space than other flats. His sensations were not unlike those of the occupants of the two-level dwelling-units at Nantes, at Leith Fort, and in the Gorbals to their variety of space, and the degree to which this single-level unit has been perfected in Denmark may explain why Danes have not yet taken up the two-level unit for experiment and development. The alternation of recessed balcony and projecting window is still the most used formula for cheap dwellings and for dearer, including luxury flatted dwellings such as Kay Fisker's and C. F. Möller's Vestersøhus, which was built in 1935-39 and has not yet been surpassed.[8]

Attempts to develop the balcony as an outdoor room to comply with the more modern requirement that the space concerned be completely private, have been slow; but a challenging article on

the subject appeared in the Danish architectural press in 1964, by Ole Dybbro , a Copenhagen architect, with the suggestion that the concern felt by architects of this decade in the development of the outdoor room, shown chiefly in experiments with the patio-house, might be expressed in experiments with the balcony. Dybbro wrote:

> "The introduction of balconies had its origin in fire-department regulations. By equipping blocks of apartments with balconies in order to provide fire-escape routes the need for providing two staircases to each flat was avoided. The balcony was quickly discovered by architects and their clients to be an asset, both as regards usefulness and aesthetic values, and in the 1930's led to a complete renewal of the apartment as a dwelling type. But there was no real definition of the balcony's function .... Instead there is lack of assurance .... There are plenty of plans today for the furnishing of rooms but no proposals for the space-arrangements of a balcony...."[9]

Dybbro , however, appends to this article a series of drawings which show how the conventional treatment of the balcony might be varied to provide an outdoor room of definite character and usefulness. These are illustrated with the case-study material.

Among efforts by architects collectively to promote thought about housing after World War I was a set of type-plans produced by an association called Better Building Habits, and in many a villa for wealthy and influential clients the architect was able to promote rational thought about space-use, with challenges offered to wasteful traditional customs. This was especially a matter of more rational housekeeping, including the cooking and serving of food, but the ease

with which maids from the country could be recruited, especially for service in or near Copenhagen, reduced the possibility of real modernisation of space devoted to cooking and feeding. In villa and flat, the dining room stayed separate. The functionalist creed being expounded in neighbouring Germany was almost invariably translated into Danish terms. The ties forged with Danish tradition were very firm. It was felt that Denmark had its own human values and own functional tradition and that was a good enough basis on which to work. Not until the Stockholm Exhibition of 1930 proved with its housing exhibit that "modernism" could be followed without surrendering human values, were Danish architects ready to take really seriously the efforts of the Bauhaus, the De Stijl Group and even Corbusier, with whose vestiges of an Arts-and-Crafts approach Scandinavians always felt affinities. With Asplund as guide, this was now felt to be possible and the years up to World War II saw an increasing use of the international functional approach to design. Fisker, in his professorial capacity, organised surveys of dwellings by his students to discover how satisfactory or otherwise they were found to be by the occupants, some of the earliest social study of this kind, and particularly in 1938 and 1939 new types of plan where space was considered according to its usefulness and not its traditional arrangement, began to be more in evidence. All the student surveys pointed to the need for more space, on a scale of at least one room for each member of the family, and also to more rational arrangements of kitchen and dining space. Even if the old

two-room types continued to be the majority of dwellings occupied, types with living room, bedroom and one or two rooms of the kammer kind, with bathroom and fitted kitchen, began to appear in quantity among new dwellings built.

Much more work was concentrated on kitchen studies, a matter in which the expert organisations run by women and the colleges of domestic science took part. In particular, the policy question of how much kitchen equipment should be included as "fixed", part of the dwelling itself, came under review. In the 19th century housing developments kitchen equipment consisted only of a sink with cold water tap and a solid fuel stove, invariably free-standing. To this the advent of gas cooking added a stone or cement bench on which stood a gas ring or two, not unlike Italian usage, and that remained common practice until well into the present century when the writer remembers visiting well-to-do apartments besides those of poorer people and seeing the roast being put into the old fashioned solid-fuel oven. Since about 1925, however, the trend has been markedly towards the fully equipped kitchen of today, and ten years later F. C. Boldsen, general manager of Kobenhavns Almindelige Boligselskab, a housing association founded in 1920 and especially active during those two decades, could say:

> "Kitchen equipment, contrary to other countries' practice, is always furnished as fixed inventory... We now always instal food-storage, broom-receptories and cupboards."[10]

About the same time experiments began with refuse disposal by chute to receptacles in the basement ventilated to the roof. The

current practice whereby these chutes are built of smooth earthenware, furnished with tightly fitting stainless steel doors and protected from fouling by the rigidly enforced rule that all refuse is wrapped in paper bags, was quickly reached and has been invariable since about 1933. More complicated systems involving water and joint use of drains for soil and for kitchen waste were not thought to be worth the money, and on the predominantly flat land on which Copenhagen is built there were reasons for not adding to sewerage capacities unnecessarily. This applied to other cities too, especially Odense and the northern Jutland industrial centre, Aalborg.

As regards sizes of dwellings, Danish apartments have persistently remained small, Up to the outbreak of World War II the two-room dwelling was still the common size for working class occupation and in 1939 about 39% of the population of Copenhagen lived in two-room flats. Over the whole country half the urban dwellings erected in 1939 itself were one-or two-roomed. The three-room dwelling was being vigorously promoted, but was chiefly a middle-class category. The largest flats built, except in a few cases of luxury blocks, had four rooms, of which one was usually the permitted kammer or roomlet, which also made its appearance as the second bedroom in the three-room dwelling. The total floor area of a two-room flat was less than 500 sq. ft. and could be as little as 430. This was a lower limit set by Copenhagen regulations, variously adopted by the other big municipalities, and notably higher than what German cities permitted.

As regards the apportionment of space to each room, the

policy has generally been to devote as much as possible to the opholdstue, occasionally, as in the other countries, containing a bed or some convertible kind of settee. The sovevaerelse (lit. sleeping space) became as small as it decently could be, with nothing of the matrimoniale about it. Similarly, the second bedroom, kammer, shrank to as little as 45 sq. ft., with strictly minimum dimensions for the kökken (kitchen), badevärelse (lit. bathing-place), and the vestibule or hall which in Danish is variously known as forstue (lit. anteroom) and the more international entrée. In larger flats, such as Vestersöhus, space was more generous but use was made of the lack of the corridor in Danish tradition to save space by allowing one room to open out of another (as in the case study of Arne Jacobsen's flats at Ordrup). This is a complex tradition, for it comes from the schloss plan, as traced in Chapter I, and the herregaard, which shares characteristics with the schloss. But it comes likewise from the age-old radelaenge peasant building tradition, where everything lay under one roof in a series of connected spaces. The corridor is a 19th century importation and it had a comparatively short life, since the trend today is away from the room-by-room planning of that period and of the earlier part of the present century, towards open planning. The entrée remains, however. On architects' villa plans, though not in common use, it carries the name of vindfang (lit. wind-trap). The traditional use of this expression was for an external porch with closed sides, now rarely built.

In these early plans of flats, the kitchen continues the 19th century city usage of being for food-preparation only. The dining kitchen, seen at Hanover in Chapter 6 to be in favour in Germany in the 1920's for workers' houses, and seen in a middle-class setting at Fulda, was not favoured by the Danes. Instead, a trend set in for the living room to be extended in the shape of a dining-corner or recess which, in turn, has developed its own kind of furniture in the shape of the well-known space-saving rectangular table with its four or six chairs able to be fitted close to the table when not in use. This spisekrog (lit. eating-corner) has widely superseded the spisestue or dining room in middle-class housing, whether flats or villas. Nowhere in Denmark was there found in the course of this study any counterpart to the survival in France and Italy of the formal dining table, with its demand for space so insistent that it hinders the realisation there, on the other hand, of southern counterparts to this northern dagligstue idea. This demand seems to have died away with Farmor's generation as the dagligstue, to her a pretence, became real, by whatever name it is now called. Opholdsstue is the name written on plans, but the expression "living room" is often heard, pronounced gutterally and sounding almost as a Danish word, to describe the whole living space of spisekrog and sitting space. The latter then gets a new Danish name of siddeplads (lit. sitting-space) or even hyggekrog (lit. comfort-corner).

Open plans and the freer use of space in all types of Danish housing but especially in private villas, were a consequence of a

more natural and less conventional way of life partly influenced by simple and unpretentious summer cottages. These have their own place in Danish society and represent the same flight from urban conditions as the villa of the 1850's. Generally they show a sharp decline from the architectural standards of other types of dwelling, and space provision is of a cramped kind. But all classes use these dwellings in the summer months, distributing themselves along the less expensive stretches of coast or on inland lakes. Of one such, not designed by an architect, a case-study was made. It seems remarkable in its inconvenience of arrangement, poor provision and unintelligent use of space, but occupying a noble site and not without architectural character. It was designed by the housewife herself, a woman of upper-class birth with little or no idea of actual house work. Because of this it serves well to illustrate the impact of informality which this kind of dwelling has made on all classes. In this cottage Royalty have been guests. The late King Christian X, stickler for correctness while maintaining close human contact with his people, invited himself to tea there and the writer met his widow there over the same meal. It was all done without any sense that entering such a cobbled wooden structure involved an act of social condescension.

While informally planned summer cottages and huts have affected Danish ideas of modern space provision and use, so have the huts and shacks which are built on the so-called kolonihaver (lit. colony-gardens, translatable as allotment gardens). These

are a purely working-class institution, intended to offer open air exercise for factory employees and also an opportunity for growing vegetables. They are neatly kept, under their own bye-law control, and while the huts are not intended for overnight occupation, many of them are in fact used for that, as though they were summer cottages, for week-ends at least. This is a characteristic space-provision which Denmark shares with Germany, and its continued provision depends on whether modern society and the modern industrial worker consider this kind of spare-time work a good thing, a necessary thing or (as Gropius intended at Siemensstadt though not Ernst May at Frankfurt-Römerstadt) a socially retrograde institution to be avoided and stamped out. On this matter Denmark has taken no stand, beyond accepting that, under current pressure of urban development, kolonihaver must be a temporary land use. They are let out, therefore, on short leases (Dan. kortfristede lejemaal). Scandinavian town plans allow for the kind of tenure in their programme maps (Dan. etapeplan).[11]

In the furnishing of these huts, which extends from neatly contrived cooking arrangements to tiers of bunks, Danish working-class people have re-acquired a skill in space-use which has helped to counteract the deadly influence of the wrong kind of embourgeoisement on their home-furnishing ideas. That influence has tended to force on them the over-scaled and pretentious reproduction furniture which is encountered in the case study at Haderslev,

inhibiting sane space-use and encountered too in the case study at Stadion Allé, Aarhus, but there coupled with a real emergence into the middle class, complete with the space needed for that operation to be complete.

Architects have not been involved in designing kolonihave huts, full as these are of the illegal and near-illegal, but there are a few well known examples of summer cottages designed by architects, such as Ole Hagen's at Rungsted built in 1941. Besides their value as properly designed dwellings, they gave their designers an opportunity to experiment with spaces and volumes, windows and doors, free of the more rigorous byelaw controls of the urban areas. The war years 1940-46, too, encouraged this kind of building rather than any other. Materials used were more or less accidental, and always simple. The results, whether designed by architects or not, were felt to be thoroughly Danish, and it was a comforting thought that in some degree, the post-war housing problem, already clearly in sight, was being reduced in size.

THE HOUSING PROBLEM AFTER WORLD WAR II.

World War II left Denmark with a housing problem, however, which was as serious as that of countries more heavily involved. It is true that there was no large-scale destruction, but during the five years of war housing and other building suffered curtailment because of shortage of materials. Shortages were caused partly by German commandeering of building materials and their removal to Germany and partly by restriction of imports, even from neutral Sweden. It was not such curtailment as that suffered by the belligerent countries, but it was enough to be serious, and to be a source of exasperation to those who had led the housing movement, for up to 1940 Denmark had kept about a year ahead of housing needs, with an annual production of about 20,000 dwellings. In particular it was galling to see Sweden now forging ahead, and from a less advantageous position, judged by the comparative state of things when war began. In the years 1940-45, annual housing output in Denmark went down to an average of about 13,000 dwellings. During the same years and the immediate post-war years, on the other hand, requirements went up by about 17,000 a year. This was mainly because of growth in population, but also the need for slum-clearance, which in 1945 was estimated at between 100,000 and 125,000 in the towns and about 30,000 in the rural areas. As a result, an accumulated shortage of dwellings was estimated in 1945 by the Housing Commission of the Ministry of Home Affairs (Indenrigsministeriet). at about 500,000. The problem was aggravated by the rise in prices, for, between 1939 and 1945, building costs rose 50 per cent,

mainly in the first three years of the war. The annual production required to deal with the whole problem, and enable new housing standards to be set up, was estimated at 30,000 dwellings.

Parliament (Rigsdag) was thus faced with several tasks. First was the need to revise housing legislation to deal with changed conditions while respecting an allegiance to traditional economic and social principles clearly expressed in national elections. Applied to housing these were, first, that government subsidies must take the form of loans in preference to outright grants; secondly that the kind of loan and its conditions of issue would vary with the social urgency of the type of dwelling proposed.

The first Building Subsidy Act was passed as long ago as 1887. Its object was to foster the erection of sound working-class dwellings, principally by subsidizing low-density building by housing associations, but it failed to achieve much importance and was superseded during World War I by more comprehensive legislation. Under this legislation, State building loans were granted, as well as direct subsidies amounting to up to 40 per cent of the building costs. At first support was confined to social housing projects but was later extended to include private building. This legislation was superseded in 1922 by the State Housing Fund Act. Under this Act, borrowers received State-guaranteed Treasury bonds which they had to sell in the open market. Its effects were less than expected, for owing to fluctuating economic conditions it proved difficult to dispose of the bonds at reasonable prices.

A decisive change in Government policy took place in the early 1930's. A new Housing Subsidy Act was passed in 1933, as one of the measures to fight unemployment caused by the world economic crisis. In order to safeguard builders against the risk of market loss, this Act reverted to the principle of direct loans from Government funds. It also laid emphasis on social housing projects while introducing new measures for controlling this kind of building. The Act laid down the principle that public authorities exercise permanent control over houses built by social housing associations. An association's rules must have Ministerial approval and contain the provision that proceeds of re-mortgaging should be applied to financing new housing instead of accruing to the association as capital for investment in anything else. This principle, intended to make social housing financially self-supporting, has been maintained in all subsequent legislation as fundamental policy, beginning with the 1938 Act in which the Government renewed its lending activities on a recommendation by a Population Commission, based on generally the same principles as under the 1933 Act.

New features in 1938 were the provision of rent rebates for large families and the initiation of pressure to raise standards of space-provision. It now became a condition in the granting of Government loans to housing associations that an appropriate number of dwellings built should have at least three rooms and be let to families with at least three children. These families were entitled to rent rebates ranging from 30 to 60 per cent according to the number of

children. The 1938 Act enabled the granting of loans both to local government and to housing associations and for building houses on private estates for owner-occupiers, but not for other forms of private building. The annual contribution by the borrower was 5½%, of which 4½% was interest.

After the outbreak of World War II it became impossible to maintain the rent levels of 1939 under these terms, and supplementary legislation was passed to provide for temporary reduction of interest on Government loans, together with deferred repayments. At the same time, other regulations provided dispensation from the payment of building taxes and an increase in the maximum loan amount.

In 1941, supplementary legislation provided for granting loans to private contractors for building to let. Maximum loans were lower than those granted under the 1938 Act for social housing and for building for owner-occupiers, but the annual contribution by the borrower was again 5½%, including 4½% interest. But in order to stabilize rents at the pre-war level, the terms could be eased as in the case of social housing.

Housing legislation after World War II has preserved all the essentials of previous legislation. The general view was that for some years after the war a relatively high price level would prevail, but that after the end of the period of shortage and the expected recovery, boom prices would fall. One of the objects of the new housing legislation was therefore to create economic conditions in which annual rent

would correspond to rent paid for similar housing in 1939. This was attempted by instituting high maximum loans, reduction in annual payments of interest, deferred repayments and dispensation from payment of property tax.

This postwar housing policy was consolidated in the Publicly Subsidized Building Act of 1946, widely known as the 1946 Act. Its provisions cover the advancing of government loans to safeguard the developer against market loss. Loans were therefore made in cash, the amount of the loan being controlled by the price of the building concerned.

The next task faced by Government was to reduce building costs by technical and economic measures and at the same time improve standards of design and construction, taking account of progress made in other countries during the war, notably Sweden, in which country several members of the Government had spent time as refugees and underground agents. It was decided to establish a special Ministry for Housing (Boligministeriet), and this was done in 1947. The new ministry took over the administration of the 1946 Act and proceeded to implement it on a wide front of activity. A town planning department was established and operates effectively there still, despite pressure for a separate planning ministry. Administrative and financial departments were set up to deal with the loan terms of the Act and to apply these to promote rationalisation and standardization of building both technically and organizationally, developing in the direction of system-building. One means of doing this is the Advance Project Scheme,

which enables outline projects to be submitted to the Ministry for advance approval, or else for the initiation of the time-consuming process of adjustment at a stage early enough to enable these not to retard system-selection.

The slum problem was not, of course, as extensive as that of the other countries studied, but it had its own seriousness, and it should not be thought that the standards of assessment were more exacting than those of other countries. The standards which the new Boligministerium took as realistic for its own statistical prognoses are contained in the Copenhagen Housing Commission's Annual Report of 1950.

Area of sleeping accommodation per person	32 sq.ft.
Single bedroom with one person using it to be at least	64 sq.ft.
Double bedroom with two people using it	64 sq.ft.
Age limit for male and female children to share bedroom	10
Total number of people per room for the whole house not to exceed	2

(Children of 2 and under are not counted.
All dwellings must have kitchen and toilet.)

In practice this meant that a family of father, mother and two children of opposite sex over 10 years old needed a 3-room house of about 300 sq.ft. in order not to be considered overcrowded. But that is no more than having a three-room house under the Glasgow Police Act of 1862, which had to be of just that floor area. What brings the Danish requirements down to this level is the small size of bedroom

demanded, and in a double bedroom the small area per person. This reflects back to things said earlier in this chapter about the attitude towards bedrooms.

On the question of standards for new housing the 1946 Act says generally that building for which loans are advanced must have no luxury character but should be complete with ordinary modern conveniences. Such limitation needed little enforcement, for, in the period before the current upsurge of West European affluence, there was every inducement to keep rent as low as possible. On the other hand the Ministry found that when standards were reduced below certain limits there was a threat of earlier obsolescence, and it would be bad policy to allow Government money to be invested in obsolete building. Generally applicable standards for room sizes in new buildings, last revised in 1963 are set out in this table. It is compiled from the Ministry of Housing handbook, Retningslinier for Rummenes planudformning (Guiding lines for the Planning of Rooms).

Table of floor areas and cubic spaces regarded as minimum standard by the Ministry of Housing (Boligministeriet).

ROOM	Floor area Ceiling ht. 8 ft. 4 in.	Floor area Ceiling hts. down to 7 ft. 4 in.	Cubic Space	Other Minimum Measurement
Opholdsstue (Living Room incl. Dining Space)	161.5 sq. ft.	183.5 sq. ft.	-	-
Kökken (Kitchen)	64.25 sq. ft.	-	529.75 cu. ft.	-
Spisekökken (Dining Kitchen)	96.8 sq. ft.	-	-	-
Spisestue (Dining Room)	64.25 sq. ft.	-	529.75 cu. ft.	-
Foraeldresovevaerelse (Parents' bedroom)	64.25 sq. ft.	-	529.75 cu. ft.	-
Other bedrooms	64.25 sq. ft.	-	-	6 ft. 10½ ins. wide

In practice, the opholdsstue can be smaller if feeding takes place elsewhere and there is usually much flexibility in the arrangement of combined areas in the case of open plans.

On the other hand the Ministry and the local authority must be satisfied that necessary furniture can be accommodated, especially wardrobes. Thus, the second bedroom in a house with three bedrooms may have to accommodate 2 single beds and two wardrobes, either free-standing or built-in, with available access. A single bedroom must accommodate one bed and one wardrobe. How that is done is the architect's business, down to a minimum width. There are no set standards of size for bathrooms, vestibules, or other utility rooms, but corridors must not be narrower than 3 ft. $3\frac{1}{2}$ ins.

Only one maximum standard seems to apply, and that only to parcelhuse, which means any independently matriculated building: villa, terrace-house, comb-house, patio-house etc. Such a house must not exceed 1190 sq.ft. of habitable floor area, which seems reasonably generous. Simple ingenuity can circumvent this stipulation, however, for it does not include outhouses, which are defined as rooms entered from the open air, but there is nothing against an outhouse also opening from the interior of the house. All that is needed, therefore, to add a room beyond the limits of floor area, is to arrange one, bearing some name such as hobby room or store, having a door to the outside and one to the inside of the house. This can then be put to any other intended use, for there is likewise nothing against its being plastered and finished. Case studies contain examples of this process, in which the authorities appear to acquiesce.

It was when faced with problems of standards, and also problems of production after World War II that the Government took

the step in 1947 of establishing the State Building Research Institute, (Dan. Statens Byggeforskningsinstitut, shortened to SBI) with the object of coordinating technical, economic and other research activities in building production, and thereby effectively contributing both to the improvement and cheapening of building. Among problems studied have been the industrialisation of building, winter building, heat insulation, and the development of new materials, aimed particularly at reducing the use of timber, a largely imported material. In 1954, the institute appointed a committee to study the possibilities of dimensional coordination, and this has been expanded into studies of system-building. Dimensional coordination as a trend was already expressed in a proposal for fixed ceiling heights put forward in 1950 by the Danish Institute of Engineers. That proposal, with others, has since been adopted for use in State-subsidized building, and in 1953 a scale was introduced as a national standard. The way is thus open for standardizing a number of installations such as central heating, gas, water-pipes, chutes, and ventilation ducts. The Federation of Danish Social Housing Associations assisted by conducting research with a view to standardizing kitchen equipment, and the work advanced so well that standardized equipment began to be manufactured in 1956. The case studies show kitchen equipment resulting from this standardization; the ceiling height in most cases is 8 ft. 4 ins., the second lowest on the standard scale.

Much of the work which in Italy was done by INA-Casa has been done in Denmark by SBI, which, however, has no executive

authority, but acts only as adviser to the Ministry. Such is SBI's prestige, however, with its dedicated staff of architects and building scientists, that its publications and research reports have nation-wide effect, and it would be hard for the Ministry or the local authority to reject a plan or a construction taken from such a document.

Typical of such reports is the handbook published in 1959, Det Lille Enfamiliehus (The small single-family dwelling). It covers the building of such houses in three parts. The first consists of suggestions for the planning of rooms based on space and access requirements peculiar to each room. The second part sets out different planning principles based on a survey which compares traditional Danish plans in the last forty years with more experimental plans. The latter have been mainly from architectural competitions of the last 25 years. The third part describes small houses built with government loans based on research into 625 typical plans of which the report publishes 78. These plans are from the Ministry of Housing records of loan-financed houses for low-income groups, some of them built in the years 1953-54 and some in the years 1957-58. Of the case studies presented in this thesis, two of the single family dwellings come within the range of this report: the pair of dwellings at Højbjerg.

Some examples of the space-use diagrams published in this report are given with the case-study material. It will be observed that SBI illustrations are less detailed than corresponding material published by INA-Casa for Italy. One reason for this is the greater

standardisation of design, particularly of drawing, in the offices of the Danish architectural profession. Detailed implementation can be assumed; but it will also be noticed that arrangements of furniture are more systematic and less pictorial than in the Italian examples. Again one reason is that Danish furniture production has been conducted more and more within limits of a standardisation arrived at in consultation between producers and such agents of the consumers as the architectural profession itself, led in this direction by the furniture design department of the Royal Academy of Fine Arts to which reference has already been made. Thus, cupboard depths are standardised at 2 ft. (60 centimeters) to which dimension the makers of electric cookers and refrigerators also conform. Half this dimension is likewise a standardised depth for other kinds of storage furniture such as bookcases, upper tiers of kitchen cupboards, and various banks of shelving. Thus, it has become a habit of Danish architects to plan their rooms in such a way that as much wall space as possible is made available for furniture of either depth. For instance, the door to a room, whether kitchen or bedroom, is customarily placed 2 ft. from the nearest wall inside the room. This kind of thing is now so automatic that it does not require to be described in detail in government or other technical literature. The case studies at Højbjerg demonstrate it in practice by showing how easily furniture is accommodated, whether up-to-date or not. They likewise illustrate the circumvention of the decreed space limit by means of a "hobby room", which in one house is

a children's room while in the other it is a study.

These case studies from Højbjerg also illustrate the effect on space provision and on constructional design created by another source of guidance, this time within the professional sphere though understood and approved by the Ministry. This is the Typehuskontor, a drawing office established by the Danish Institute of Architects in the 1950's, with the object of designing a basic cheap single-family dwelling on one floor, assuming a normal suburban site and a variable number of rooms. The main lines of this typical dwelling emerged as a rectangle carrying a pitched roof, with a longitudinal wall under the ridge. Architects and others can buy their typehus plans from the Institute and either build from them directly or vary them. In the case study material from Højbjerg the plans have passed through an architect's hands and thus contain a number of variations, but all over Denmark typehuse are to be found where no architect has been employed, yet where the result, because of its origin, carries a professional stamp.

The basic concept of the typehus was simplified planning and simplified construction. But it implied acceptance of the trend to prefer the villa to the flat, a trend which statistics prove to have been in steady motion since the 1920's at least. In 1926 only 12.6% of newly built dwellings in Copenhagen were villas. By 1929 this had risen to 23.9%. By 1935 the percentage was 25%, where it remained until the German occupation of 1940 interfered with normal building. Resumed

in 1946, villa-building got a run-away start with an arrangement of 1½% state loans for this type of dwelling. That was because villas could be built with the brick and timber which were in ready supply whereas apartment blocks needed at least some steel and concrete which were in limited supply. The percentage rose to 40% before the raising of restrictions on building materials restored it to a more just proportion of 30% to 35% early in the 1950's, where it has remained.

Much of this emphasis on the single family dwelling has to do with a rising general standard of living but particularly with the levelling of incomes which successive social-democratic governments have brought about. So the writer has been told, repeatedly, in the course of interviews with villa owners. Often the people were just like those in France, Italy or even Germany, to whom a villa was still a long way off, and Scottish families of the same standing would still be in their council houses or flats.

It is also a matter of production on a basis of less existing obsolescence. As we have seen, Denmark set out on its production after World War I (indeed during it, for neutrality allowed the national economy to proceed unchanged) in an advantageous position. Slums as known in the other countries considered in this study were well on the way to elimination. Housing finance was established on a basis which made housing a profitable business for everyone, including the government. Standards of accommodation, though modest and for some people uncomfortable, were, on the whole, better than a small

poor country might have expected to reach. Quantitatively, production was good. Statistics show that from 1912 to 1915 Copenhagen produced 2,177 dwellings per annum, and that from 1916 to 1931 a total of 66,294 dwellings were erected, an average of 4,143 per annum. In a similar period Milan, a city twice the size of Copenhagen, but at the same stage of economic development, built only 18,399.

But only a small part of this production was for re-housing. During the same period, 1912-1931, the population of Copenhagen rose from 462,000 to 617,000 and the greater part of the capital's housing effort was directed towards the provision of dwellings for immigrant workers from the countryside and the provinces, as the rural-urban population balance accelerated the kind of change which, with other countries, Denmark began to experience a hundred years or so earlier. Again, redevelopment (Dan: sanering) began on a serious scale as early as 1930, and the areas cleared were such as the other countries were to retain in use for considerable time to come.

It is, therefore, difficult to make a quantitative comparison between Danish housing production and that of the other countries. Yet within Denmark the position is not viewed everywhere with satisfaction. The desirable annual output of houses per annum to provide for new construction and replacement of sub-standard houses is taken to be 30,000 for the whole country. Yet totals for peak years of production, 1939, 1949 and 1954, have hovered at between 23,000 and 25,000. Even

mechanised building is not managing to surpass this total, which seems to be what the national economy can produce. Thus, while it cannot be said that Denmark still suffers from a shortage of dwellings, a fully successful solution of the problem of replacing sub-standard dwellings and of achieving appropriate distribution of dwelling types, old and new, remains tantalisingly unattained. As affluence, so-called, increases, standards will rise and the sub-standard category will grow, as more dwelling types and sizes are included in it. Both at the higher levels of government, official and elected, this prospect causes anxiety, for it could mean that once again the country will fall behind its socially necessary programme of house production. To overtake this backlog would require investment in building beyond the limits which top bankers think safe. The present Governor of the Bank of Denmark expressed himself thus about the matter at a course for senior administrators of housing associations held in 1964; a carefully worded statement, but striking a note:

> "Selve nybyggeriet of boliger andrager efter de seneste opgörelser omkring 1800 mill. kr. om aaret, hvilket er ca. 12 pct. af de samlede bruttoinvesteringer og ca. 3 pct. af den samlede produktion. Maalt paa denne maade er der altsaa ikke tale om store beløb, men det bör huskes, at det ogsaa i økonomien gælder, at det sidste straa vælter læsset, hvorved menes, at et stærk pres paa byggesektoren kan bidrage væsentligt til at bringe økonomien ud af balance." (According to the latest figures, building new housing involves a sum of about 1800 million kroner per annum, or about 12% of total investment and 3% of total production. Measured thus the amount is not large, but it must be remembered that in economics too the last straw capsizes the load. In other words, increased expenditure on building could contribute significantly towards putting our economy out of balance). [12]

Control of housing economy by government is not restricted to its overall quantitative relation to overall investment. There is also local control of its quantity and its siting in relation to local authorities' investment programmes. In the almost total absence of what in Scotland is called local authority housing, these are largely programmes for the construction of roads and services. Care is needed to see that housing projects and servicing projects, the one undertaken by housing associations and the other by the local authority, keep exact pace. On the one hand, capital investment in the former must not be impaired by slow completion consequent on slow development of services. On the other hand, completed roads and services must not lie unused, waiting for housing construction to catch up. On the whole, integration of effort and of finance seems to be fairly successful, but local authority officials and private architects interviewed about the effect on the actual provision of space and of services were ready to accuse government of having a "stop-go" policy, leading to programming difficulties which, they felt, the U.K. generally had been able to avoid.

One kind of service calls for special mention for it particularly concerns space provision and space use. It is the application of waste hot water from the electricity generating stations to domestic heating both for space heating and to heat domestic water. This development began in the 1930's and it is obligatory now for all generating stations serving the national grid to supply hot water in this way in collaboration with local authorities, and housing associations. Photographs are

appended with the case study material showing the steel pipes which carry hot water in circulation from the power station to residential areas, flow and return pipes lying parallel in the same concrete trench. A photograph also shows the simple equipment inside the house itself. Hot water is metered through a constrictor valve which forms the temperature control for the householder. It circulates directly through hot water radiators and through the calorifier coil in the domestic hot water cylinder, which has a separate constrictor control so that if necessary it can be run at peak heat in summer, while the radiators are shut off. The modern Danish householder is trained in the operation of these controls and in all the case studies examined there was full satisfaction with the result.

Use of waste hot water in this way throughout urban and suburban areas is hindered by the economic difficulty of providing this comparatively expensively built service to sparse developments. One municipality, Aalborg in north Jutland, has solved this by providing itself with temporary heating stations which can be built as part of peripheral suburban developments and supply them with hot water until other development grows round them to the point where it is economic to extend the hot water mains from the city. The temporary station is then removed and can be used for another similar cycle of development further out.

The matter was discussed with a prominent Danish heating engineer who was asked in particular whether it had been wise thus

to exclude from virtually all Danish residential development the rival forms of heating, such as electricity storage and gas-and-oil fired systems. His opinion was that, in the short term view, Denmark might suffer a little, especially if gas were discovered in quantity under the North Sea. On the other hand there was nothing to prevent the present municipal systems from being continued and extended using municipal gas furnaces to heat the water either instead of or together with the electricity stations. On the long term view, it seemed that a time must come when nuclear furnaces were in use to generate electricity and their waste would provide plentifully for the present systems and any reasonable extensions of them. For rural communities and isolated residential development well beyond urban peripheries, oil-fired hot water heating would be the best for Danish houses for many years to come. Part of the reason for this was the skills which had been built up all over the country in building and maintaining piped hot water systems which, he said, were considerably cheaper to instal in Denmark than was the case in most other countries, including those with which the present study is concerned. This was a matter of interest, therefore, both to the promoter, such as the housing association, and also to the money lender: the credit and mortgage societies.

Here brief reference should be made to the credit and mortgage societies which during the last three-quarters of a century have played a fundamental part in financing building operations and advancing space

standards in Denmark. These societies are associations of borrowers which on the basis of collective liability and mortgages on the properties involved borrow in the open market. Borrowers receive their loans in the form of serial bonds. They have to realize the bonds themselves and so they run the risk of market losses but also benefit from market gains. Credit societies organize first mortgages and mortgage societies second mortgages. This seems an elaborate system, but also seems to operate efficiently. It has the advantage that mortgages are transferable to new tenants and new owners and thus can represent accumulated capital, which can be realised when, for instance, a family decides to build a villa, for which a proportion of capital is needed. In this way these societies bridge the gap between government resources and those of the developer, the gap which, in the bad old days, led to overcrowded cheap dwellings and empty expensive dwellings.

In 1907 there were in Copenhagen 13,000 empty dwellings, many of them villas of which the purchase price or the rent was too high for the capital resources or the incomes available to lay down a price or pay a rent. By comparison, there were in 1913 20,000 empty dwellings in Glasgow which had three times Copenhagen's population. This indicates the severity of the economic strain in Denmark in the early days of industrial development. Many, of course, were flats of the "Farmor" size and both in the case of flats and of villas the situation reflected the use of standards, of space, of finish, of ornamentation (it was the age of elaborate ornament), even of space-

heating, which the country could not afford. On the other hand it is significant that, as the modern system of mortgage finance through housing associations developed, the number of empty houses declined. By 1924 there were only 1,900. By 1929 the number had fallen to only 24. The value of space provided per family had been brought to equal the capitalised rent which the family could pay. This is not to say that all space in Danish housing is let at what other countries would call an economic rent. On the contrary, the high standards of construction which prevail and the care taken that standards of space provision are such that they do not quickly become obsolete, are the factors which guarantee a long income-earning period for each house after amortisation. Capital built up in the hands of the housing associations in this way for re-investment in more housing, is a means whereby space can be increased, and other standards raised, without driving the rent to a level out of reach.

Spurred on by government policy after 1946, this investment method met with success in quantitative output of houses, the pre-war output being reached again in 1949 but also going a long way towards solving the problem of appropriate distribution of the various dwelling types, particularly for families with children. Whereas over half the urban dwellings erected in 1939 were one - or two - roomed flats, this type of dwelling accounts for only 17% of the new housing provided so far in the 1960's. But the new trend has not yet had time to alter the overall picture of housing. Of the total existing housing accommodation in 1940 and in 1950, one - or two - roomed flats accounted for 44.4% and 43%

respectively, and in 1960, 40%.

DWELLING TYPES SINCE 1946.

Enough has been said in relation to the discussion of the SBI report, Det Lille Enfamiliehus, to indicate the place of the villa in modern Danish housing. Undoubtedly it represents what a majority of Danes would like to live in, but their decision that this is so rests largely on the straight comparison with the flat, as they know it, still the preponderant dwelling type. And there are other dwelling types in process of development, which may affect public opinion in the future, when they become known. Meanwhile the flat itself is still in process of development. Four characteristic flats of the period after World War II are studied in detail and are reported among the case studies: two at Copenhagen, one being in the centre of the city and the other in a semi- suburb; one at Aarhus and one at Haderslev, apart from the Kollektivhus groups separately studied and reported on at Aarhus and Silkeborg.

Of apartment or flatted developments, there have been several distinct trends since, about 1948, serious work was resumed on this dwelling-type with a return to normal supplies of building materials. The main trend in the 1950's was inspired by the Kay Fisker blend of modernity and traditionalism in external design, and produced schemes such as Bispeparken in Copenhagen and the Højbjerg scheme at Aarhus which is among the case studies. There we find traditionally formed blocks of three or four storeys, with recessed balconies and tiled roofs. Access is by the old-established common stair with entry to two flats per

landing. The blocks are usually arranged in hollow squares with open corners through which they connect to form an open space system. Footpaths lead to a shopping centre, not placed in the middle of the scheme but at one end of it, the end nearest the bus stop, tram stop or suburban railway station.

Another trend has been towards the tall block with lifts, either in the form of towers (punkthuse) as at the Bellahöj scheme in Copenhagen, and at Höje Söborg, where the accompaniments expected from such concentrated schemes are provided: concierge, shops, restaurant, hobby rooms, rooms for special social gatherings etc. In the provinces this trend is represented at Odense and also at Aarhus, where the case-study scheme at Langenäs, frankly called a kollektivhus in the tradition of Gunnar Asplund's first such institution at Stockholm, is perhaps the most interesting in the country. The Bellahöj scheme is distinguished by an important effort to remove dullness from the stairway and elevator communications by making the communication unit into a glass-sided turret sandwiched between two turrets of dwellings, the whole forming one tower. Its achievement is not dissimilar to that obtained by Mario de Renzi in his Tuscolano tower blocks in Rome described in Chapter 4. But the tower block in any form does not seem to appeal to Danes. The writer is inclined to regard the attitude of the young couple interviewed at Langenaes as typical of many such, who might be expected to be the age-group likeliest to find in this dwelling type, especially a kollektivhus, the answer to

their problems. They could hardly wait to get out and build themselves a villa. This impression is supported by Professor Peter Bredsdorff of the Royal Academy of Fine Arts, who commented thus on the results of an architectural competition held in 1962 for a housing neighbourhood:

> "Some of the submitted designs contained tall buildings .... The post-war years have seen a number of experiments with tall buildings but there are signs that interest in this type of development is declining. Experience steadily accumulating shows that it has a number of serious shortcomings, in any case as a family dwelling. Social contact between families in tall buildings is considerably less than was hoped for; lack of an outdoor space adequate for the family is felt; and the absence of contact between dwellings and play spaces for small children is unfortunate. When the fact is also considered that the tall building because of its dominating scale demands comprehensive aesthetic evaluation of large parts of the town if it is to fit into the townscape in any meaningful way, a certain reluctance to use this building type in the future may be expected.[14]

Emerging from the situation represented by this judgement is a third trend. It is towards a grouping of dwellings not dissimilar to the "mixed development" of English practice of the 1950's, but omitting the tall blocks. Instead, the three-storey walk-up block is retained as the representative of the apartment block, but it is grouped with a majority of dwellings in the form of single-family houses grouped in terraces, clusters, and also spaced out in various villa formations particularly at the perimeter. One such is a scheme for the development of the historic town of Ringsted, having as its basis a most promising town plan with segregated pedestrian and vehicle accesses.

More comprehensive and also nearer fulfilment is the major new development at Albertslund, the first of the Copenhagen Regional Plan satellites. Some study material of Albertslund is submitted, partly because it is not without a basis of comparison with Gela in Sicily, being of similar scale and not dissimilar character, allowing for climatic and cultural differences. Chief of these is that, on its flat site, Albertslund has none of Gela's site opportunities and none of its dramatic views.

Consonant with the Regional Plan, Albertslund is planned as a new town to be developed in two stages, Albertslund South and Albertslund North, astride the Copenhagen-Roskilde railway, ultimately to reach a population of 40,000. The Regional Plan, published in 1947 and commonly called "the Finger Plan", proposed to guide development beyond the urban perimeter into communities of this size set at intervals along the main roads and railways radiating out of the city. Five such lines were selected, mainly existing in some form, hence the nickname. It is acknowledged that these places will be to some extent dormitories, but the Regional Plan provides for a dispersal of industry and already this is creating employment which can cater for them. It is intended, too, to encourage offices to move there, providing opportunities for married women to find work near their homes.

The plan of Albertslund is the work of Professor Peter Bredsdorff. It can be taken, therefore, as a practical expression of his convictions

about urban environment, and so far, to nobody's surprise, it is entirely without tall buildings of any kind.

The Regional Plan reserves the areas between its fingers as recreational countryside, taking up and modernising the theme of the skovtur. Albertslund includes a proposal to plant a large area of woodland north and east of the town and already about a square mile of this has been acquired and planted.

Building development in Albertslund South is well advanced, and some case study material of it is submitted, including its town planning, which has proceeded in close touch with that of Cumbernauld in Scotland, on the basis of a shared characteristic: relatively high density. The reason for this at Albertslund is to bring people as closely as possible to the railway station for their daily journey to work, the station being the first piece of development carried out. In the first development, 7,000 persons and their roads and immediately necessary open space occupy 60 hectares, at a gross density, therefore, of 49 persons per acre, just over the density of the housing at Prestonpans and within touching distance of that of the Adalberto Libera unità at Tuscolano. Again, similar to Libera's design, the majority of dwellings are single-family houses, each with courtyard garden or terrace. The result is a town with a low silhouette but a high density, and as the existing landscape is rather characterless, the intention has been to create a distinctly urban environment. Thus,

the houses are set in groups round regularly formed open spaces which serve as play spaces for younger children. Older children have larger open spaces where noisier play and also supervised play, including "junk" playgrounds, can be accommodated, but these have not yet been constructed.

The town plan provides for separated vehicle and pedestrian networks with underpasses at crossings, the pedestrian network being the lower throughout. The pedestrian network has its own shopping street, leading from the railway station, with the intention that shopping can be done on the way home from work. It has also a dramatic canal-street, which forms part of the site drainage system and takes up a traditional town planning idea brought to Denmark in the 17th century by the Steenwinckel family of Dutch engineers who came there at the invitation of Christian IV. This stretches for the whole length of the development and provides on its northern side sites for walk-up flatted blocks. It is hoped to develop a townscape of canal, footbridge, trees and houses, interrupted at intervals by higher-level bridges carrying motor traffic, each stretch between bridges thus forming an enclave or little precinct. At the railway station, a town centre is planned, with town hall, library, 2 schools, and a leisure-time club. Dispersed among the housing is to be a church and 3 nursery schools. But for all that vehicle and pedestrian accesses are separate, it is possible to drive almost to the front door of the house. From the vehicle terminus in each group, a car park, it is normally only 50 yards to the furthest

house - the distance allowed, it should be noticed by way of comparison, in the Scottish building regulations. In Denmark there is no such rule, but this distance has been found to be a satisfactory limit. In France, at Marly-les-grandes-terres, the corresponding journey can be double this length. In Italy, at Tuscolano it is only slightly more, and at Gela may be slightly less.

The Albertslund courtyard houses owe much to Utzon's Kingohusene, and on their more generous scale of floor-space (1000 sq. ft.) they have an L-plan not unlike Prestonpans, where, as Chapter 8 relates, the maximum floor space is 765 sq. ft. for the same number of rooms. The extra space is given, characteristically, to the living and dining area, which extends into both legs of the L, with an intimate and practical relation between dining area and kitchen. In one of two type-plans used, the living area is the communication route from all bedrooms to the bathroom which, however, is discreetly cut off by the vindfang or porch. Thus it also serves as a cloakroom, in the ablutions sense. Storage is provided in this type-plan by means of a storage room. In the other type, access through the length of the house is by a corridor lined with storage fitments, like Adalberto Libera's. Regarding the bedroom at the far end of the living-room, the Danes had the same idea as the Scots at Prestonpans; according to the Albertslund brochure, it can be

> "..... used as a T. V. room if it is not needed as a bedroom. Parents will probably in most cases choose the bedroom furthest from the living room, but they also have the choice of using the bedroom next to the living

room if the preference is to let the children have the other end of the house."

All the houses proposed for Albertslund are designed for system-building, according to the Ministry of Housing Circular of 30th March, 1960, using for the structure pre-cast concrete elements and as far as possible limiting work on the site to the assembly of these elements. Nothing has been done to camouflage this construction either outside or in. Joints in walls, floors and ceilings reveal the existence of each element. Construction is as follows, and has produced a rate of erection of three houses per day.

On point foundations the foundation beams and bathroom floor are placed by crane. Following this the external walls are erected; if the facade faces a foot-path or square, insulated reinforced concrete elements are used. Those facing the terrace are window elements of wood. Then the roof elements are placed into position and covered with felt. The house now is completely closed. Central heating is then installed, and pipes for water and drainage. This is followed by spray painting of the ceiling and walls. The interior assembly begins with the laying of the finished floor, and is completed by the erection of the partition walls, internal doors and kitchen equipment.

The electrical installation is carried out with cables run in ducts or housed in the partition wall elements. When that is carried out and the bathroom fittings installed, the house is completed. All of the elements have pre-finished internal surfaces before they are assembled in the building.

Albertslund is on a very flat site, but plainly the system of construction is of interest in the development of terraced houses on sloping sites, with a bearing on the Schultze-Fielitz experiments in Germany. That and other aspects of this important Danish contribution to housing design, to housing in relation to town and regional planning, and to the application of system-building to the provision of space indoors and out-of-doors, is therefore carried forward to the conclusions presented in Chapter 9. It is not, strictly speaking, a case study, but necessary illustrative material is included with the Danish case study material.

Besides being a result of trends of preference for certain forms of development, Albertslund represents the long-term effect of the loan arrangements of the 1946 Act, which, itself responding to trends at that time, has altered the ratio of high-density and low-density building. In 1939, low-density development accounted for about one third of the total, but in 1954 it was about one half, and in 1964 it moved up to five eighths. More favourable loan terms, plentiful money during and just after the war, and the difficulty of obtaining larger flats, have all helped to encourage this type of building and are still encouraging it. And it is less a question of flats versus villas than one of finding in the terrace house and its variants a cheap alternative to the flat where space may be more easily created and more flexible.

After its early start at Bakkehusene, the terrace house made little progress until this low-density trend took its grip, although the

late 1930's and the early 1940's produced new pioneering examples. One of the best was Magnus Steffensen's much illustrated two-storey development built in 1941.; another was Viggo Möller-Jensen's terraces for artists ranging along the banks of the lake known as Utterslev Mose, west of Copenhagen. The disadvantages of the two-storey terrace house with its view over neighbours' gardens made architects attempt various devices to achieve privacy mainly applied to the placing of each house in relation to the others. Out of many attempts none seem to have succeeded better than Arne Jacobsen's group at Klampenborg begun in 1950, where the houses are staggered so as to provide each with a re-entrant angle which cannot be overlooked. This too is a well known scheme, much illustrated. A less famous example was selected for the relevant case study in this thesis, where the architect, Thorkil Ry Andersen, had made a survey of Italian hill-town architecture with its little private corners and enclosed spaces and in the social sense achieved more than Jacobsen did, although the architecture itself may be less distinguished. There was Italian interest in this project, and it was illustrated in Domus, so that there is additional reason for its selection.

At Söndergaardsparken, northwest of Copenhagen, an attempt was made in 1950 to combine the qualities of terrace housing and villas in a layout of a Radburn character. Round a wide central green space lie semi-detached single-storey villas each with its own little private and sheltered garden, while terrace-housing in one or two storeys flank

a peripheral access road. Here as in most other layouts of this kind, houses are uniformly orientated to the sun and the access-road circulates independently of them.

It has been a criticism of Söndergaardsparken's wide green space, based as its authors have said on the English village green, that it has failed to become a social focus. No cricket is played on this green by children or adults nor other ball games, and since it is too big for children's less organised activities, few children are seen playing there. Instead they congregate at the car parking spaces, climbing on the cars and playing with them until chased away. Some Danish research has indicated that the width of this open space (90 yards) tends to divide the houses on each side into different social communities. This is not necessarily wrong, but is an effect to be reckoned with.[15]

It was taken as a criticism by Danish architects and later schemes of this kind have avoided wide green strays while retaining the precinctal idea. One such, Sövangen, was studied at Aarhus. Here the stray is treated differently from that at Söndergaardsparken. It is divided by a vehicle road giving access to four informally planned clusters of terrace houses, each with its parking space. Between these clusters and the periphery of the development, which consists of comb-houses closely approaching the category of free-standing cottages, the stray is further carved into sections by groups of planting. The effect has been to divide the development into groups of dwellings whose inhabitants can

build up a certain neighbourly relationship. Visits here confirmed an impression that this relationship is different in quality from anything established at Söndergaardsparken. Sövangen householders praised the arrangement and claimed that it was better climatically than having a large unbroken space in the centre of the development. It tended to break the force of the west wind, which is strong in Denmark, especially in Jutland, all the year round. On the other hand, some householders in the comb-houses were inclined to consider the stray superfluous, including its pedestrian route which, they said, they seldom used. Part of the reason for this was that they had their garages in a compound more easily reached by walking along the peripheral road. It was, however, better than having neighbours' gardens right up to one's own back fence. This seemed to indicate that a stray of a desirable width has its usefulness, both as a separation between dwellings, keeping families independent of each other, and as a connecting link between groups of households, the opposite effect. If this is so the selection of this distance is critical. At Sövangen the distance between groups of terraces and the line of comb-houses is 40 yards and the conclusion is that such a distance represents a balance between connection and separation which the width of the stray at Söndergaardsparken, more than double this dimension, does not establish. Söndergaardsparken, nevertheless, remains the showpiece of this kind of development in Denmark, perhaps in a similar way to that in which the terrace houses at Bakkehusene reached that

status. It is the home of delighted intellectuals (explained one such) to whom the wide green stray is both an emancipation from the claustrophobic qualities of more conventional layouts and a stimulant to consider and solve academic or professional problems which are the concern of the person himself and not that of some neighbour, near or distant.

Apart from the question of dimensions of open space, it was at Söndergaardsparken that the first of many Danish successes was achieved with establishing patio conditions for cottage dwellings using only landscape planting. For the first few years, of course, there was little privacy in the tiny shrub-surrounded gardens which extended outside the cottage livingroom windows. By now privacy is complete and since the shrubs and small trees are a perfect means of breaking the wind without creating areas of turbulence, these little gardens are among the most satisfactory sitting-out spaces found anywhere in the northern countries. The consequence of so much concern with privacy was a gradual acceptance of the patio-house as providing a maximum of privacy if used in its fully-enclosed form, and capable of varying degrees of privacy when the degree of enclosure is varied.

Two patio-house developments were studied, Grenhusene (lit. "twig-houses") in Copenhagen and Kingohusene in Helsingör, the former by Eske Christensen and the latter by Jörn Utzon. The Grenhuse achieve a near-maximum of privacy, still outdone by the Adalberto Libera scheme at Tuscolano, Rome, and the Prestonpans scheme in Scotland, whereas the Kingohuse balance the demands of privacy

against the wish for an outlook beyond the limits of the patio itself.

There seems little doubt that the patio house is well on the way to solving a problem of providing for individuality within a large and necessarily anonymous urban housing group, and, in time, it looks as if this kind of dwelling, partly because of its access to communal services of many kinds, will be able to compete with the villa as a well-liked kind of dwelling. There remain, however, the complete individualists among Danes, who will have none of either. Amongst these are the family Terp, encountered in a shack in a wood near Silkeborg, father, grown-up son and son's wife. They earn a living as free lance mechanics and handymen. They do welding, repair tractors, do occasional ditching, and other heavy work for farmers, belong to no trade union, and own their shack and land without the aid of mortgages or housing associations. It contains four rooms: two bedrooms, a living kitchen and a workshop off the kitchen, with a W.C. and cold water tap in a lean-to erection. Heating is by a cooking stove, supplementing the cooker, both wood-burning from plentiful local supplies. The Terp household is not a case-study, for they resent inspections and would not have liked their house to be photographed inside, but its incredibly unaesthetic interiors, not painted for many years and full of makeshift arrangements, were seen by the writer and were in complete contrast to the steadily climbing housing standards of the case study examples. Again in contrast to the squalor of the shack is the beautifully kept yacht which father and son race on the Silkeborg

lakes, turned out for the occasion as yachtsmen. Where do the Terps fit into the beautiful neatness of the modern Danish housing group? One cannot but feel that they would be unhappy, unless perhaps they lived in a particularly shut-in patio house with their tools and welding gear all over the house and the patio used for their enormous and probably valuable store of scrap metal. It would be an interesting but for the moment impossible experiment.

CASE STUDIES

(1) HISTORICAL EXAMPLES

The first sheet of case study material marked as appended to this chapter refers to 19th century history. First come colour photographs of the interior of the surviving Victorian dwelling at Nyvej in the Frederiksberg district of Copenhagen, mentioned at the beginning of this chapter. The room arrangements and the contents mostly date from the 1890's and the first decade of the present century when, in the hands of a well-to-do family of tobacco merchants, this was the scene of lavish entertainment. Dinner was often served for 18 to 20 people, who, after the meal, dispersed throughout the three reception rooms of which the centre room is the dagligstue, while that on its right as you enter is the library and the other the music room, containing a concert grand piano of a famous German make. Though the occupants were higher in the social scale than Farmor, as described by Soya, the pieces of furniture and the room arrangement here bear a relation to his descriptions, including the inlaid table, plush covered chairs, tall mirrors and other features.

The suite of day-rooms is a feature inherited from the period of Liselund, when the Danish herregaard broke out of its mediaeval castellated form of rooms wrapped round a courtyard. Also inherited

is the lack of development of the formal bedroom of the kind the same period witnessed in full development in France and central and southern European countries. Unlike kings elsewhere, Danish kings do not appear to have held their morning receptions sitting up in bed. Reflecting national custom in the same way, the bedrooms in this Frederiksberg villa by comparison with the day suite are insignificant and poorly furnished. The subordination of "Farmor's" bedroom to the other rooms in the house, even if these were not in daily use but only made to look as if they were, is part of the same tradition, which we even found to affect the standards used to judge overcrowding in slums. It continues to the present day, for, as the later case studies reveal, the bedroom is almost always subordinate whether in flats, villas, terraces or even the latest kind of patio house. General reference to this matter was made in Chapter I, where the insignificant bedroom was shown to be a northern European phenomenon.

Also shown are old photographs of a flat of the 1890's now no longer existing which was referred to as forming part of the same development as that described in "Farmor's House." It was occupied at the time by a lieutenant in the Royal Danish Navy and has something of the qualities which Soya attributes to the flat occupied by Mrs. and Miss Tychsen. The grouping of furniture, pictures and indoor plants are all decidedly prominent features of this comfortably arranged urban dwelling. It will be noticed that in this flat electric light has been installed.

The photograph of the villa also referred to at Katrinevej in Hellerup accompanies the other historical material and illustrates what has been said about early Danish villas. Here is the flight from town to suburb and the scene is a little livingroom in daily use, although the photograph is clearly a posed one. By the time the picture was taken (about 1909) the elderly owner had retired from his Copenhagen secretaryship but was still pursuing his hobby of yachting by means of a small boat anchored among the fishing craft in the tiny harbour at Charlottenlund where, only a few miles from the capital city, a fishing community survived until quite recent years. He and his wife are clearly proud of their neat and comfortable home, by the standards of the time.

There is no electricity, for the hanging lamp in the centre of the room has an oil reservoir and a wick. Grouping of furniture is carefully studied and one at least of the chairs is made for leaning back, having a cushion for the head. The floor is carpeted and, by repute, this room was comfortably space-heated from a corner stove. In such a room, as in the Fritz Jürgensen drawing depicted on another sheet, the table is the central feature, in the one case with a hanging lamp, in the other with a standing lamp. Both give an altogether different impression of space use from that of the photograph of a Scottish interior of roughly the same date; 5 Bellevue Crescent, Edinburgh, to which reference is made in Chapter 8, where the fireplace is the focus and the man and his wife are sitting at it.

The relationship between these old urban and suburban dwellings and country houses, indeed the bearing of Liselund on all modern space

provision and space use, was studied at a Victorian country house built in 1860 at Thorsminde and a plan with photographs is illustrated. The rooms here are on the scale derived from the grand manner and there are careful scale relationships between rooms and their furniture, including pictures and mirrors and even light fittings, extending also to the ornamental setting of the diningroom table which is ready for a party of 14 to sit down and partake of dinner (in Denmark still known as middag although it no longer occurs in the middle of the day). This country house, which has an unbroken herregaard tradition, makes it easy to understand how in the urban dwellings these matters of good taste and of well assimilated and well applied social custom, have taken charge of humbler room arrangements. From this it is a comparatively short step to the distilled but still elegant space arrangements of the minimum modern dwelling.

At Thorsminde as in the Frederiksberg villa, the major part of the house is devoted to dagligstue use, including an extension called a garden room. Including the room in which the owner has his desk, comfortable chairs under drawingroom conditions are provided for between 30 and 40 people at one time. Once more by contrast the bedroom accommodation is cramped.

That it was cramped too in the old country tradition which belongs not to the herregaard but to the bondegaard (lit. peasant-yard) is depicted in a photograph of a painting of the realist school which flourished in certain parts of the country at the beginning of this century.

It shows a deathbed scene, the bed itself being in a cupboard recess opening from a livingroom where the kind of furniture is recognisably similar to that of the herregaard, despite the obvious class difference.

At Thorsminde, at Katrinevej and elsewhere, the beds are single. It is noteworthy that the double bed never developed in Denmark to any extent, and it is scarcely possible to buy one today in Danish furniture shops. The matrimonial arrangement is twin single beds. It is also noteworthy that bed-making is quite unornamental. The covering is the featherbed, dyne, and not much attempt is made even in the best class of house to make this lie in a sculpturesque form during the day in the way which, for instance, is customary in middle-class Scotland, where the down quilt is folded ornamentally with geometrical precision, as the Scottish case studies, with exceptions, reveal. The dyne is a shapeless bag of down in which the contents can be concentrated at the shoulders or at the feet by appropriate shaking, laid lightly or wrapped close. Being so highly adjustable, it serves as a covering all the year round and is seldom reinforced by blankets. This was true even before the days when bedrooms were centrally heated, and Soya's description of Farmor's bedroom included the dyne, translated as down-quilt.

Related both to the herregaard and to the bondegaard is the praestegaard or presbytery where in a photograph of another painting the priest is coaching a young man for university entrance. The scale is that of the herregaard, but the evidence of more careless social

habits, the coat hung on a nail, reflects the informality of a peasant community.

Certain operations in a house have a timeless and classless quality and the reproduced painting of a cottage housewife standing peeling vegetables at her sink, a scene of the 1880's, is curiously close to the same kind of scene today.

(2) EGEBAEKSVEJ 119, HØJBJERG

A whole dwelling is examined in this first of the modern case studies and the subject is a flat built in 1957. It is the flat occupied by the daughter of the naval family mentioned above. Some of the furniture she still uses is recognisable from the old photographs and, while her taste has developed towards that of the present day, it is still strongly conditioned by family background. Within the white walls and low ceilings of a modern space-saving dwelling, something of the generous atmosphere of her parents' home, built to older and more generous space standards, is still present.

It has been remarked how, after the adoption of the balcony both to simplify fire escape and to provide more living space, the Danish flatted block settled down to a more or less standardised form in which the balcony was half in and half outside the building, and access to flats was by only one staircase. That is the plan shown in this case study, where the arrangement of the blocks also follows a pattern of open yet sensitively inflected layout belonging to the academic influence

of the period after World War II, which has been described. It will be seen that although the blocks are arranged round hollow squares they are orientated so that livingroom balconies face either south or west while staircase entrances and utility rooms are north or east. Garages are in a compound on a scale of one to every third dwelling. This is not enough, and many cars stand outside where they can.

The occupant belongs to the first generation which took seriously the education of women for professional or other useful work, and has worked all her life as a physiotherapist. Now in her 60's, she still works at this profession and one room in the flat is therefore a clinic. This occupies a space which almost certainly would have been a bedroom in other occupancy, and it will be noticed from the plan that there is no bedroom. The occupant sleeps in her livingroom, using a large folding settee as a bed, and storing her clothes mainly in drawers in various bureaus and chests. A few dresses and coats which would suffer from this storage treatment are hung in the hall cupboard. The significance of this is twofold. First that for many years she was quartered in a hospital where her accommodation was a bed-sittingroom, establishing the habit just described. But another significance is that of returning in her old age to the gracious day-suite of her parents' flat. At the same time she is taking with her the modern attitude towards the dagligstue which uses the whole space every day and does away with the habit of locking up rooms for special occasions. Thus in a true sense her present suite stretching from end to end of the flat is more genuinely

a herregaard feature than was her parents', particularly with the balcony which, attached to such a big indoor space, has almost the quality of the garden room at Thorsminde. As the plan shows, the balcony is in full use as an outdoor room. It faces the sun and enjoys a view through the open end of the square of buildings of which it is part, a view extending across a villa development into open country beyond. The landscape in the enclosed space between the buildings is covered with grass surrounded by hedges of moss roses with a few paved areas, one of them for drying clothes and others for children to play in. Like many first occupants of new flats this occupant was able to influence the planning. That is why there is no sign of a door into the omitted bedroom. It is also why certain awkward things have been done, including a sliding worktop in the kitchen, which collides with the kitchen door.

The photographs taken of the interior present a clear picture of stout utilitarian finishes, especially in bathroom and kitchen, with neat workmanship, although this includes a soil pipe descending inside the bathroom when it could have been hidden away in the thickness of the wall. The Danish attitude to the bathroom, strictly functional, seems not to object to this feature, and it is interesting to recall at this point that such things as coloured bathroom suites, carpeted bathrooms, bathrooms with big mirrors, etc., are seldom seen in Denmark, even in luxury villas.

Domestic hot water is supplied to these blocks of flats from a

communal boilerhouse together with that circulated for space heating, all of it forming part of the financial arrangement of monthly payments to the housing association.

The way in which the livingroom is used disguises the fact that in these flats space standards are low. The kitchen at 65 sq. ft. and the bathroom at 52 sq. ft. are both minimum rooms, and the "clinic", designed to be a small bedroom at 80 sq. ft., is only 15 sq. ft. above the accepted minimum, while the livingroom if it were divided up to include a double bedroom would scarcely allow one of more than the minimum acceptable. The flat in question, being an attic, suffers the further space restriction of sloping ceilings, which most Danish municipalities allow to come down to 5 feet from the floor. To the present occupant none of this matters, not even the staircase climb which makes this an unsuitable house for an aged person, which she must soon become.

(3) FLATS AT ORDRUP

The Arne Jacobsen flats at Ordrup, which form the next case study, do not accept the conventional plan but attempt something unusual which prevents the stair from occupying frontage and fits in a little room off the living room which can be used either as a quiet room or a television room, as desired. It was found, in fact, that tenants used this room as an extra bedroom and grumbled about its lack of privacy when put to this use. In the flat studied in detail it was in use as a maid's bedroom, the household in question having raised its social and

financial standing to the point where it wanted and could pay for a domestic servant living-in. Not long afterwards this family built itself a villa and here, therefore, was an example of occupants attempting to extract from their dwelling a kind of space use for which it made no provision, with consequent tensions. That husband, wife, two children and a maid was a strain on the accommodation also showed itself in the bathroom, a photograph of which was taken showing evidence of overcrowded use. It was often noticed that these minute Danish kitchens and bathrooms make too little provision for domestic laundry and this was not the only occasion on which drip-dry shirts and various smalls were found hanging on strings strung between the soil pipe and a towel hook. The official explanation is, of course, that laundry facilities are provided in the basement, but this seems more and more to belong to the age of full linen chests and to be less useful to the age of nylon and of slender wardrobes.

Space standards are somewhat higher than in the last example. Kitchens are 90 sq. ft. and while the small room off the living room is the minimum of 64.25, the living room itself is over 200 and each of the bedrooms is 160 sq. ft. Only the bathroom, at 45 sq. ft, was really restricted, an unfortunate choice in the case studied, but bearing out what has been said of a general attitude to the utility part of the house.

That one bedroom had to be reached by going through another seemed not to be quite justified by the explanation given by tenants that parents could be content to go through the children's room, if not vice versa, and it seemed a defect of some magnitude when visitors had to be

taken through a roomful of sleeping children to visit the bathroom.

Apart from tenants' own ideas about use of rooms the architect's variations of plan suggest different uses for the extra room off the living-room. In one plan arrangement it seems destined to be the master bedroom, grouped with a small bedroom and entered from the forstue. It has its separate entrance to the balcony, a useful arrangement having regard to the use of the balcony for airing bedclothes.

It was noticed that, in the example studied, the young family had furnished their flat partly with modern furniture, such as low-backed armchairs and settee, and partly with pieces given them by parents. The latter included ornaments, and among these a pair of silver candlesticks. Candlesticks are still important in the Danish household for the candle-lit dinner when guests are present is still an institution and extends also to the family dinner on Christmas Eve and other such occasions. The mixture of new and old made a pleasant environment, and the fact that nothing was stridently new made it easier to accept the daily litter of magazines, books and other objects laid about the room.

One of the photographs brings out clearly the habitual Danish method of treating electricity points, one above the other, on door facings. Current comes at a pressure of 110 to 120 volts and until recently there has been no earth wire. Its introduction in newer installations has followed the increase in the use of electric domestic equipment having big metal surfaces and a danger of building up static charges.

The layout of these Jacobson flats is in strictly formal rows

orientated so that kitchens and at least one bedroom face northeast while livingrooms with balconies, including the extra room with its miniature balcony, face the sun. In alternate spaces between the blocks the ground is used for car parking and for garden space with children's playgrounds, but it was noticed that the children played by preference in among the parked cars, as shown on the photograph.

Although from the outside the blocks showed an architectural character giving promise of individuality inside, the detailed plan scarcely fulfilled this promise and, despite distinguished authorship, these dwellings did not seem to take any high place in the list of Danish achievements. They did not compare favourably with the more advanced French or Italian examples.

(4) FREDERIKSBERG

The flats studied at Højbjerg and at Ordrup are on three and four floors respectively, without lifts, in each case having communal facilities in a basement, these consisting of laundries, cycle storage cellars and pulterkamre, or general purpose storage rooms. Development on four floors with a basement represents the generally accepted limit of height for building without elevators, and this is the normal maximum for areas of medium density which, under modern Danish town planning, now extend well into the suburbs, for Danish town plans are zoned according to heights of buildings rather than by densities. At nodal points in these town plans, such as suburban shopping centres which

coincide with important bus stops or stations on suburban railways, town plans allow multi-storey building, and these are permitted too in selected areas within the older urban districts. This is not only because of high land values and in recognition of a need on the part of residential developers to run to height in order to get a return on the price paid for the site, but also in response to the town planning idea that city districts will too easily descend into lifelessness after business hours if some residential development is not permitted among the mushrooming office blocks. Within Copenhagen the old residential district of Frederiksberg, still its own independent local authority, maintains this kind of balance and a multi-storey residential development there is the subject of the next case study. To maintain a controlled skyline, the limit of height is 9 storeys and flats are on the scale of four per landing orientated so that the rooms to the north are only secondary rooms of the larger flats. This provides the principal rooms of all flats with south or west sun. Sizes vary from single room dwellings to flats of four rooms, and it was one of the latter which was studied.

The four rooms are arranged in such a way that a large balconied room inevitably forms the opholdsstue, and two other rooms, one small and one large, become bedrooms, one of them equipped with built-in wardrobes. The remaining room can be used as a bedroom and families living here with many children use it in this way. Being next to the kitchen and also opening into the livingroom through big folding double doors, it can be used as a diningroom, and this is the way in which it was

found to be used in the example studied. Prudently moving into this flat from a smaller one in the same building as soon as they could afford the mortgage, the young couple concerned, bordering between working class and middle class standing, began their family in this flat, living as far as possible in middle-class fashion and using this to better themselves. At the time of the writer's visit they had two children, one still in the pram. Their shares in the housing association had doubled in value and they were about to dispose of these in the open market and with this money acquire a villa. Some months later, having sold their shares to householders desperate to move to Frederiksberg, they made this move, on terms probably at the legal limit. The following year the same family made its second equally advantageous move, changing jobs from Copenhagen to Aarhus and acquiring there a more expensive villa using the proceeds of their two sales of shares.

The Frederiksberg flat made easy housekeeping for a young couple with two children. The rooms were if anything too big, and difficult to furnish, though it will be seen that the standard low-cost furniture of diningroom and livingroom is in scale with the rooms, even as regards such things as the heights of window sills, the size of door openings, etc. This was a musical household and a music stand of Victorian design, acquired cheaply, helped to keep in scale the big opening between dining-room and livingroom. The biggest problem of furnishing, the housewife explained, had been carpets, a difficulty which would have been incomprehensible to a Scottish or even a German housewife, for the floors

in this dwelling are of excellently laid polished hardwood and called for no more extra covering than a rug or two. She found them noisy. Her small boy, on the other hand, shown on one of the photographs under the guidance of a somewhat older cousin, had made the diningroom into a wonderful race-track for his tricycle, extended at times into the hall. This hall is large enough to hold a settee and also a rope ladder which someone gave as a toy. Beside the settee is the telephone. On the kitchen photograph the neat standardised kitchen furniture, finishing exactly one tile-width below the window sill and level with the cookertop, etc., comes out clearly.

The bathroom, not day-lit, is in the centre of the dwelling. It was found to be ventilated only by gravity through the series of shafts which separate it from the nearby bedroom and there were complaints that the ventilation was too sluggish, leading to the use of deodorant devices. As in the other flats and houses studied, hot water for space heating and for domestic supply comes from the municipal district heating system with the electricity station as its source, as already described.

(5) STADION ALLÉ, AARHUS

While young people with growing families have moved in their hundreds and even thousands through the same cycle of financial operations, from flat to small villa, to larger villa, and so on, single people have often stayed where they were through many years, but at the same time enjoying in another way the fruits of their investment. Again, not

all Danish housing has been done by non-profit making associations, and a speculative flatted development in Aarhus was visited, built in 1930, which reaches the standards of those provided by housing associations while yielding handsome profits to the present owner, a single elderly lady of working-class origin, who lives in one of the flats herself.

This modern version of "Farmor's House" was studied with great interest, apparently free of the economic strains which Soya describes, for maintenance and repairs throughout the building seemed to be of the highest class. The site is one of rising values and had the construction been done by a housing association, the shares would by now have been enormously valuable, as the property must be to its present owner.

The little flat, consisting of four rooms, seems to reproduce the whole range of domestic comfort and even spectacular luxury of well-to-do late 19th century Danish dwellings. Three rooms opening from one another through double doors constitute a suite similar to that at Nyvej, Frederiksberg. One contains the dining-table, in proximity to the kitchen, and another the piano and radiogram, continuing the custom of having a separate music room, though the room contents hardly go back as far as the 19th century. Everything from the 20th century is there: the well padded chairs of the 1920's, the reproduction pieces of the 1930's, a few well chosen functional pieces of the '40's and '50's, and on the walls are well chosen oil paintings of the last school of realistic painting before the period of abstractions. This is as far as the present owner wants to go

in the direction of a modern environment, except in the kitchen and bathroom, where formica and tiles, a stainless steel sink and an electric cooker match the recent bathroom renewal of sanitary fittings and a handset shower as a joint acceptance of functionalism.

The photographs appended show all this and give an impression of a well assimilated bourgeois taste which carries with it a considerable grasp of how to group furniture and other objects to convey a sense of comfort and welcome. There are no outright vulgarities, and absolutely no mess. Neatness, indeed, extends to the newly-fitted bookcase in the entrance hall and to the well contrived wooden fittings which conceal the somewhat old-fashioned and ugly hot-water radiators. Hot water, of course, is from the public supply, metered and controlled in the basement.

This flat overlooked a well equipped and well used children's play-space, liked especially by the age-group 7 to 12, or about that. A layout of it is appended to the case study. It shows the folly, however, of siting such an institution so that children have to cross at least one major road to get to it.

(6) HADERSLEV

The flats at Haderslev studied are three-floor walk-ups on the outskirts of this growing market town. They are set out in open formation somewhat on the lines of Marly-les-Grandes-Terres though the scale is smaller. There is a shopping centre with communal laundry and central heating plant, for this is beyond the range of a public hot water supply, and the ground between the blocks is landscaped in the customary

Scandinavian way with grass and paths, moss-roses, bushes and a few trees.

The size of dwelling varies from two rooms to four rooms, and the sample dwelling visited is one of three rooms, occupied by a divorced wife and her grown-up daughter. Both are of working-class standing and go out to employment in the town. They had arranged things so that each has a bed-sittingroom so that they can share the opholdsstue between, meals being taken in the mother's bed-sittingroom where the dining-table, it was noticed, is as far from the kitchen as it could possibly be. The writer was told that this dining-table nevertheless is in daily use and got an impression from visiting this and other working class homes that the modern conveniences of cooking and serving food are on the whole less understood at that social level in Denmark than at higher levels. Indeed, it is here that furniture and the space use it represents is in greatest danger of becoming pretentious.

It was noticed how strong was the insistence in this house on elegance in the opholdsstue . Furniture was of a lush bourgeois kind, spotlessly clean and polished. The floor was covered with a rich carpet and there was the usual collection of potted plants, a writing desk and a standing cupboard which we were told contained clothes. There was also an upright piano. The daughter was the member of the household who played, having learned the art as part of her schooling. It was an interesting commentary on the furnishing of this house to hear that the removal men when they arrived carrying the piano knew exactly where it

should be put. Apparently all the tenants in this block put their piano there, where the space is exactly right.

Kitchen and bathroom were fully fitted with standard fitments and a hanging cupboard had been contrived in the small entrance hall borrowing some of its space from each of these apartments. There was the usual rubbish chute on the landing serving two flats, but no balconies.

Asked about the position of the dining-table, the housewife said that it would be intolerable to have this in the opholdsstue and the kitchen was too small to eat in. Her preference and those of other housewives of her standing, she said, was to have a kitchen big enough to eat in. Being near the border of Germany and having visited friends across it, she envied the way in which German houses were arranged in that respect, and her particular criticism of her own flat was that the daughter's bedroom, opposite the kitchen and otherwise possible to use for meals, was too narrow for that purpose. This was why the table had been taken into her room. The daughter's room had the minimum permitted width of 6 ft. $10\frac{1}{2}$ ins.

As in all the Danish flats visited, the finishes in the public stair were of carefully laid terrazzo on steps and landings, and a hard cement rendering on the walls, with metal handrails and polished white metal covers to the rubbish chute which opens on each landing.

In this block of flats hot water is metered at each radiator, the amounts read annually and an arrangement exists for refunding an amount out of the agreed annual payments to the society representing hot water

not used the previous year.

(7) VILLA CASE STUDIES : HØJBJERG

For the sake of following the fortunes of the young couple from Frederiksberg, the first villa case study is their second villa, at Højbjerg, Aarhus. It happens, too, that parents-in-law were house-hunting in Aarhus at the same time and a decision was taken to buy two villas side by side in the same development and to settle there in the form of the grande famille of which such interesting evidence was also discovered in France.

Thus the two villas form a case study together and it is of particular interest to see how in the one case the young family were expanding into larger quarters, still having difficulty in furnishing these adequately, while in the other the parents-in-law, the husband having been a very senior salaried official with a history of living in large official residences, were moving from larger quarters into smaller and having the opposite difficulty of fitting into restricted space their quantities of bulky old furniture. Photographs of the same furniture in the former dwelling were procured and are appended with the case study material. These illustrate two things. First, a not too great disparity as regards scale between older Danish furniture and modern, different from the corresponding pieces seen in France and Italy; and secondly, the clever scale of these modern villas, capable of absorbing old furniture into their shapes of wall and areas of floor space almost as

easily as they provide an adequate background for furniture of the contemporary kind. Again, both houses show skill in the placing and grouping of the various pieces and in using the rooms provided.

This, too, is the case referred to above where, in order to defeat restrictive space standards being applied at the time of erection, extra space was won for the house by including a "hobby-room," which ranked as an outhouse and did not therefore count in the total floor space calculation. The young people made this into a children's playroom. The old people made it into the old man's study, both in defiance of regulations but apparently in complete equanimity, without danger of police or local authority action.

Both as layout and as regards their detailed planning, these villas conform to a type which has taken a firm grip on Danish suburban design in recent years. Earlier villa developments followed the well known pattern of ribbon development, extending their facades along main roads with garden developments in front and behind and narrow, rather useless spaces between the houses, too narrow for the windows of principal rooms to be put there without serious danger of overlooking. In Copenhagen the proverbial Lyngbyvej villas, built in the 1930's along a spectacularly wide and straight main road leading northwards out of the city, are the standard example, just like those of Milton Road, Edinburgh. In the countries studied, only Italy, for reasons given in Chapter 4, avoided this form of development, which was wasteful both of land and of frontage, and rarely succeeded in making the houses themselves as comfortable to

live in as fuller consideration of all the functional factors would have achieved.

Fuller consideration of functional factors led the Danes to the kind of villa development of which this case study is an example. Frontages are narrow so as to save costs of roads and services and skilful planning of detail allows the principal rooms of one house to extend within easy earshot and sight of the nearest wall of the adjacent house with excellent privacy. Windows capable of being used for overlooking are eliminated along that side of the adjacent house and by interposing garages together with some use of levels, a screened approach to each house is provided along its windowless wall, while at the same time something resembling a patio is formed outside the livingroom of the adjacent house. And so the rhythm proceeds. The effect is to divide the open space attached to each house into three parts: a front garden extending between the gable of the house and the road, through which runs a path leading to the main door and also a driveway leading to the garage; a side garden of roughly patio form outside the principal windows of the main room, and a back garden which is frankly overlooked by neighbours but exists as a play space for children and as vegetation grows may eventually develop its own private character.

Orientation is of course all-important, and in the present case has come off remarkably well, for the French window opening from the opholdsstue into the patio garden faces almost exactly south and the re-entrant angle of the patio formed by the garage and its containing wall

forms a sun-trap for the whole summer afternoon and also well into the evening, as the western sun shines straight into it. Photographs illustrating the use made of this patio with the family in each case sitting out round its outdoor table, are no exaggeration of the satisfactory effect which this plan arrangement has produced. Sheds and other garden buildings are forbidden by conditions of ownership and it is noticeable that the garages are large enough to contain at their rear end, each with its set of steps forming an entrance, a tool space large enough for such garden operations as potting to be carried out. In both these houses the garage contains a car, and this was found generally to be true of Danish development. But the potting space in the one case contained unused furniture since the old people had not managed to squeeze in all their belongings into their house. The absence of storage, including the absence of any roof space because of the low pitch of the roof, was the chief complaint heard from both households about the space provided.

The L-shaped livingroom in these houses provides for three kinds of activity. Clearly the part nearest the kitchen is intended as a spisekrog (lit. eating-corner), although only the young family used it in this way. The old people had installed there the settee and chairs and table-with-the-lamp from their former house, pressing into use the nearest bedroom as a diningroom and apparently not minding the distance from kitchen to dining-table which results. The other function which the livingroom allows is winter-time sitting at or near the wood-burning hearth, in a corner studiously free from draughts. Both families had made full use

of this in their grouping of furniture. The third function is the modern one of sitting in settees and armchairs round a low coffee-table with plenty of room for legs, while enjoying either a view of the garden or the presence of radio or television. Both families had used for this purpose the space provided at the French window and picture window, taking advantage both of the outlook from these windows and succumbing to the inducements of the well dimensioned floor space itself. In the case of the old people, this meant that they had two coffee-table arrangements, the old-fashioned one with high table, high settee and lamp, and the modern one with low table, low settee and easy chairs. They had not been able to bring themselves to sell the old and rather beautiful set of high table, high settee and straight-backed chairs upholstered in a fine rose-coloured damask. The writer and his family entertained to coffee were served this decorative meal at the low table by the window in the modern way. A use for the high table, however, was discovered. The old custom of filling in the evening with L'hombre which Soya noted applies here, and for it the high table and settee are used, coffee-cups amongst the cards.

As in all the other Danish dwellings visited, the kitchen is a working kitchen only and very happily arranged with the usual standardised equipment. A possible criticism lies in the separation of kitchen from bathrooms and from the little chamber in which the public hot water supply is received and distributed, and in which the hot water cylinder also resides. This could have been obviated by sliding these rooms as

a block against the kitchen and entering the house further along the central corridor. Asked about this, both households said that this would have offended against custom. Entry to the house must be near the livingroom and not among the bedrooms, and the few seconds which were added to the journey taken by the hot water from the cylinder to the kitchen taps was only a triflingdisadvantage. It was noticed in both houses that the heating chamber was used unofficially as a drying room for laundry, thus releasing the kitchen from this tiresome usage so obtrusive in the various flats studied, which could have no such room, their heating supply being dealt with in the communal basement.

Because of the custom already mentioned of placing doors to rooms sufficiently clear of the nearest wall to allow furniture of standard depth to be placed against this wall, one of these villas had stood up to an unusual test. The old man is one of Denmark's leading entomologists, the author of scientific works on the subject, and his collection contained in standard cases was thought to be a serious problem to be faced when moving out of his official residence. There was no need to worry. It fitted in exactly along one wall of the diningroom, intended no doubt to be the main bedroom, used as such in the young people's house, and dimensioned for wardrobes.

The bedroom arrangement, best studied in the young people's house, shows the conventional arrangement of a master bedroom with room for a double bed or twin single beds, a large wardrobe whether built-in or standing free, and children's rooms, which include built-in

cupboard space, a space for a single bed and also desks at the windows for use in doing school homework. The built-in cupboards are optional features offered by the developer to purchasers, and for the sake of the butterfly cabinets the old people dispensed with one range of built-in wardrobes or cupboards.

A feature particularly liked in both houses was the pitched ceiling in the main room contrived by constructing the roof in the form of girders built up of wooden spars. This device not only gave a pleasant increase of height in the centre of the room but helped to define the different areas into which the livingroom is intended to be divided.

Despite the traditional form of architecture of these villas there is an underlying and important resemblance of intention between them and the development at Cap Camarat, described in the chapter on France, and it is this particularly which gives interest to the next case study, the terrace house and patio house development at Risskov, referred to already in the general text above.

(8) RISSKOV

One part of this development consists of conventional terrace houses, adopting the now common method for terrace housing in Denmark of staggering the dwelling units so that re-entrant angles are formed front and rear, giving privacy and shelter to the entrances to the houses on one side and similar sheltered conditions for the sitting-out space at the head of the garden on the other. The case study material includes

plans of these terrace houses and also interesting photographs of colour effects which have been obtained by varying the treatment unit by unit along the entrance facades facing the main arterial road which flanks one side of the development.

But the chief interest lies in the other half of the development where, using the same frontage unit but omitting every second house, the dwelling units stand in a relationship similar to the Højbjerg villas with an arrangement of garden court and kitchen court between. Complete absence of windows along one wall flanking this court gives total privacy for the use of each court by one house.

The houses are arranged on three floors; a basement with garage, laundry, drying room and storage, a ground floor with kitchen, eating-corner and opholdsstue, with a hall and stair leading to the upper floor. This contains the master bedroom and two small bedrooms with bathroom.

In the house visited, great care had been taken with furnishing, blending with excellent taste the old and the new, and the photographs of this house though not in colour are among the most satisfying of the whole study. The house is being used so far as could be judged exactly as planned, a perfect relationship between space provision and space use. This extended also to the kitchen yard and garden court or terrace and the couple concerned, professional people, were pleased with their house in every respect. It was noticed how the livingroom was allowed to develop its volume upwards into part of the roof space, a matter with which Arne Jacobsen led the way in his Klampenborg scheme.

The relation between kitchen and eating-corner is almost as direct as in German practice, but the eating-corner remains very much part of the livingroom, sharing its gracious scale and making a decisive break with the functional design of the kitchen. This followed the usual pattern of standardised units set out with a skill almost beyond criticism, and constructed of excellent materials.

In the cellar the heating chamber is placed nearest to the main road, reducing the cost of laying this service from the mains, and with the kitchen and bathroom immediately above it, the domestic hot water system is in its simplest form, with quick service of hot water to the taps.

This development is planned round a large communal central space, but since the terraces or patios are a fully adequate private garden space attached to dwellings in the one half of this development, the access road is allowed to separate these dwellings from the central open space. This might be a point of criticism but is possibly justified by economy of road construction. The terrace houses of the other half of the development have gardens at their back, opening into the central open space. They are so lush and well grown that it was difficult to believe they had been laid out only three years before the photographs were taken.

The architect for this scheme, Thorkil Ry Andersen, designed it after a visit to Italy where he was as fascinated as the present writer with the neatly grouped arrangements of Tuscan and Umbrian hill towns

and on his return to Denmark made a conscious effort to capture some of this quality in the present design. It is a measure of how far he succeeded that his scheme was selected for illustration in Domus, where the privacy of the garden courts was especially noted: "e in queste ultime è interessante l'allineamento sfalsato, con muro laterale sporgente, che consente una particolare privatezza."

(9) BRABRAND

As already described, the patio-house entered Danish practice partly on the success of the little enclosed gardens at Söndergaardsparken in Copenhagen, and partly at the Grenhuse scheme and the Kingohusene schemes in Copenhagen and Helsingör, each described below as case studies. Before this, however, they had been used in their complete and doctrinaire form for private villa development and a case study was made of one such building, on the hill above Brabrand in Jutland, a deliberately secluded site where indeed the attempt is rather to recreate the characteristics of the old Danish farmyard in the context of a modern functional villa design. This is a house built by an architect, Knud Friis, for his own occupation, and it therefore represents a kind of case study in which it is to be expected that both the space provision and the space use will be to some extent specialised and possibly also remote from the living habits of other people. The case study and its photographs show at a glance that this is so. In no other house in Denmark or Germany was anything found following so strictly the space-use and

furnishing disciplines of doctrinaire modern design.

The house itself has a simple functional plan in which plumbing is grouped at the front door, not unlike the Risskov houses, in the form of bathroom and kitchen with a heating chamber between. The heating chamber is for oil-fired hot water, for this is out of range for some years of any heating mains. The kitchen, custom-built rather than composed of standard units, has direct contact with the eating-corner, in which there is no attempt at elegant formality. Beyond are two rooms for children with a large playtable or worktable for them in a widened passageway, which thus becomes a children's sittingroom or playroom, a clever provision of space and a satisfactory test of it in use, for the Friis children use it as designed.

Upstairs is the opholdsstue, with its big picture window overlooking the valley beneath, not the patio, with next to it an unusual shape of parents' bedroom in which beds are end to end as in a summer cottage and having only clerestorey lighting. A home drawing office enjoys a view similar to that of the livingroom in the other direction. The bedroom is perhaps the most extreme example found in this study of neglect of the matrimonial bedroom tradition of other countries. It is in contrast with the letto matrimoniale of the Italian case studies. Factual data cannot be given, but there is a probability that the livingroom, with its divan-like settee, is used in this kind of Danish villa for the intimate matrimonial relationship; its first-floor isolation makes this possible. In that case the bedroom adjacent is no more than a projection into the

present of the bed-recess of the old peasant tradition, in which it is difficult to believe that all sexual intercourse took place.

The patio or yard is related as an open space only to the ground floor rooms and this gives it some of the character of the bondegaard (lit. peasant-yard), the traditional Danish farmhouse, a quality heightened by the arrangement of garage and outhouse along the opposite side of this yard, as though they were a farm steading, and further emphasised by the slatted opening, like a farm yard gateway, which gives the yard a view over the valley, the same view as that enjoyed by the main room of the house.

As a garden this enclosed space is only partly successful. The walls round it have the effect of creating areas of turbulence when the wind blows, although this is mitigated to some extent by the generous tree planting which the surrounding hillsides retain.

As regards the highly disciplined furnishings of this house, the photographs do not at all exaggerate: they are really like that on an ordinary unannounced visit. The architect's wife explained that it was all part of a way of life which she and her husband had adopted with others whose adherence to principles of modern art and modern design they share.

Professor Tobias Faber attributes the introduction of this kind of architecture to Denmark to Jörn Utzon in his own house built at Hellebæk in 1952. It consisted of one big space divided up by thin partitions designed for various functions, with big glass doors and windows open to broad terraces descending with low retaining walls down

a gentle slope. Of this kind of architecture Faber says:

> "It appeared about 1950, strongly under the influence of Mies van der Rohe and his less excitable concept of architecture as something to be found in logical well analysed buildings with a static quality; looking for simple solutions and for absolute beauty in systems of construction, geometrical forms and rules of proportion, at the same time exploiting the possibilities of industrial production and the precision-work of machines."[16]

(10) GRENHUSENE, COPENHAGEN

Each version of the terrace house as it appeared in Denmark was given its own characteristic name, such as "Comb-houses," (the form in which two-storey and single-storey buildings alternate, giving an indented skyline) and "chain-houses" (for the more loosely connected version of the same thing, in which outbuildings or the like are used as links). The name "grenhusene" is built up from the word gren which means both a branch and a twig, including the leaves, and the picture thus suggested is one of houses representing leaves attached at their extremity to a narrow communication-way, each house having space round it as has a leaf. The architect responsible for this application of a botanical image, not so much to the terrace house as to the patio house, is Eske Kristensen, one of those who carried out the pioneering scheme, Bellahöj. Through it and other similar schemes of tall blocks he acquired an interest in seeing a new development of horizontally connected dwellings to represent in another dimension the social relationships and convenient services of vertical buildings. He can

therefore be seen somewhat in the same light as pioneers of this kind in other countries, such as Schulze-Felitz in Germany, but in Denmark the Grenhus scheme stands alone and awaits its further development. Danish patio housing generally has travelled in another direction, that indicated by the Jörn Utzon Kingohusene scheme at Helsingör.

The layout is very simple, consisting of partially covered pedestrian streets 2 meters wide running at right angles to access roads and giving entry to the houses. Houses alternate with patio gardens, and gardens and houses are arranged on opposite sides of the street so that each house faces the wall of the patio of the house opposite and thus has privacy of entry and no direct overlooking. Houses have windows on all their facades, including the wall which inevitably is shared with the patio of the neighbouring house, but in this wall windows are kept at clerestorey level in order to avoid overlooking. Tenants visited assured the writer that this feature did not lead to spying of neighbour upon neighbour, but it has been regarded as a defect of the scheme that such spying is made possible. On the other hand this defect would have been easy to obviate, either by roof-lighting the rooms concerned (bathroom, kitchen and dining-corner) or else by using glass bricks as in the not wholly dissimilar scheme studied at Fulda, in Germany.

It is easy to see how the plan has been composed. True to the idea of the gren, services run along the narrow street like the sap-routes of a tree and plumbing is congregated at the end of the house nearest the street in a tight little group of pipes and equipment. A rough wash-up place, analogous to the idea of the salle d'eau of early French

housing, is placed beside the bathroom and serves also as a cleaning-up place for a working man arriving home, for it is also adjacent to the front door. The livingroom and dining space, the latter conveniently arranged in relation to the kitchen, are used as general circulation space too, for the group of three bedrooms opens on the further side. Separation of bedrooms from bathroom, regarded in Great Britain as a thing to be avoided, is a less serious matter in Denmark where, as in France, it is not indecent to walk about the house in pyjamas, still less so in a dressing-gown, and where there is a certain frankness about bathroom functions which, perhaps, has not yet become general in Scotland and England. This is not merely a question of what can be done within the family itself but what can be done in front of neighbours and visitors. Thus the thought that some member of the family who had to go to bed early might appear in déshabille at the door of the bedroom block in this grenhus and make for the bathroom while someone was being entertained to late evening coffee at the nearby coffee table, is not the disturbing thing in Denmark that it still would be in many a home in Scotland. This is the explanation, too, of the details of the housing accepted for mass-production at Albertslund.

In the example visited at Grenhusene the tenants were a young married couple, who had recently moved from Jutland to the capital, the husband being employed as a skilled mechanic and qualifying by part-time education as an engineer. There were two children of school age and a baby in arms, who appears on one of the photographs. His cot had been placed almost in the form of a room-divider between the

dining space and the rest of the living-room and his mother explained that this was the best position, near enough to be heard by his parents if he cried at night and at the same time convenient to the bathroom for cleaning up. This seemed a more convenient arrangement than the position occupied by the baby's cot crammed into a bedroom which was found in certain of the French case studies, and it seemed to help further to justify the position of the living-space in the Grenhus scheme. The sofa or settee in the living-room is available as a spare bed for visiting relatives or friends, and can be used as a double bed if and when sets of grandparents arrive for an overnight visit. The desk, partly a status symbol to signify middle class standing and indicate a kind of employment either professional or business-executive, is in this case a necessity, for it is here that the young husband does his evening studying and where, when he becomes an engineer, he will do his evening paperwork, something which is accepted as one of the burdens belonging to the management class, and giving the status symbol something more than symbolic significance.

The kitchen was found to be conventionally fitted with cooker, sink and cupboards, without the use of the storage wall which could have been placed between kitchen and dining space with greater convenience of storage and of access to table equipment. An ingenious small fitting, relevant to the kitchen, was a delivery hatch by the front door very like that seen in Nantes, and placed there to enable housewives to go out to work and have deliveries of food made to their house while they are away.

The gardens in these houses were found to consist mainly of a flat area of grass with usually one quite small flower-bed and with climbing plants arranged along the walls, including the wall of the opposite house. A cement flagged terrace was provided with the house, having access from the living-room through a French window and partially covered by an overhanging roof. This is a popular feature with tenants not only because of the shelter it gives for sitting out-of-doors but also for its protection of the exposed wall of the house, facing southwest into the prevailing wind which, particularly in the western part of Copenhagen, leads to a lot of rain-penetration round the joints of windows. Tenants visited were pleased with their enclosed patio gardens though, without much gardening ambition, they were treating them more as convenient spaces in which to allow children to play, clothes to dry, and for occasional hobby-work out-of-doors, avoiding the mess which such operations create if conducted in the house itself. They were in fact being treated as outdoor rooms rather than as gardens in the sense which would be understood if they were of the more conventional and overlooked kind related to free-standing villas. The fact that they could not be overlooked (except by neighbours if they stood on chairs and peeped through their clerestorey windows) had a particular appeal to the housewife, but less to the husband, who felt that he would not mind sitting in his garden in the evening and be seen by people passing along the corridor street. Indeed the husband in the case of the house visited would have liked an open fence along that side of his patio rather than the closed

fence which had been provided. This was something like the mixture of reactions to enclosure encountered at Prestonpans.

The open space between each strip of houses is laid out as a forestry plantation, intended ultimately to separate each gren of houses from the others. The tenants of the house visited both thought that this was privacy overdone and would have preferred that their garden should open into a wide green space there where people could stroll about and meet each other.

Though this thesis is not primarily concerned with construction, it was noted that the construction used at Grenhuse was of concrete elements using modular coordination and it was also observed how the dimensions of these elements and their scale relationships gave a dignified and elegant quality to the perspective of the pedestrian streets. These, it was noticed, had the form of pergolas with climbing plants providing occasional shelter and tenants were asked whether they would have preferred to have the streets roofed over or partly roofed over so as to give protection from rain. Answers to this were various but it seemed that there was a consensus in favour of the streets as they were, giving light and air and not having the character of tunnels which they otherwise would acquire. This is an interesting reaction to compare with the reactions at Prestonpans where, deliberately, and following a visit to this grenhus development, the access streets were treated alternately as pergolas and as covered ways, and where (as the relevant case study shows) the covered ways are the ones preferred.

The high quality of interior design and of furniture, the first encountered in Denmark drawn from the utility ranges, was noticed in this house and also the good combination which it made both as regards space use and colour, with the scale of the rooms and the colour scheme provided by the developers. These qualities are well brought out in the case study photographs.

(11) KINGOHUSENE, HELSINGÖR

Helsingör is a fine old historic town at the tip of northern Sjaelland nearest to Sweden, owing its existence to that strategic position which also provided it with the famous Kronborg castle, excellent example of the early Danish Renaissance. It is a prosperous, growing place, now ranking as a city with the erection of its fine 14th century Olaikirke into a cathedral in 1961.

Kingohusene is named after Bishop Kingo of Fyn, 17th century hymn-writer, and joint author of the 1685 prayer-book, an important Danish confessional document. As a selected case study, its importance is partly its layout, dating from 1958, in which the principles of segregation of vehicle and pedestrian traffic observed at Söndergaard-sparken are maintained, but in a form consonant with a trend towards more dense development which set in towards the end of the 1950's. Its importance lies also in its authorship, that of Jörn Utzon, one of Denmark's noted innovators, who reached international fame with his winning design for Sydney Opera House in the competition of 1956. He

was known to fame in Denmark already by the design of his own house, built at Hellebaek in 1952. It is one of the examples selected by Professor Tobias Faber to illustrate avant garde design of the 1950's, as already quoted. It was one of the first in Denmark to accept the Frank Lloyd Wright "Usonian" principle of the working core. And by continuing to make a division between an entrance court facing north and a garden facade extending along the sunny side of the site with a view over open country, it helped to anchor avant garde design to this useful early-modern arrangement, in itself containing the basis for the Radburn idea of movement-segregation. But while pioneering modern architecture and planning are drawn upon in both examples of Utzon's work, his Kingohusene layout makes its own distinct advances. Privacy is almost as complete as at Grenhusene, yet there is a sense of openness; this marks a delicate advance along lines which in their nature are divergent.

Whereas at Grenhusene there is no attempt to provide outlook over open space beyond the patios, Kingohusene gives each house its patio garden, but leaves one side of each patio open to a view across a significant piece of open space extending between the housing groups and including as a landscape feature a small lake.

The houses stand in closely grouped clusters. The central open space is in places only one house-length wide, and at its greatest width no wider than four house-lengths, or the 40 yards which at Sövangen was found the most satisfactory dimension. According to tenants spoken to, this degree of separation is in this case a little too small. Radios

can be heard across the lake, assisted by the resonant quality of the water, and even snatches of conversation, which were thought to be uttered at a non-carrying level of sound.

The L-shaped house plan allows greater freedom of room arrangement than the rectangular plan adopted at Grenhusene, though presumably at greater cost. Each house has its opholdsstue extending along one side of the patio, while the kitchen and bathroom face away from the patio. This means in effect that the plan divides into a bedroom wing running from east to west, a livingroom wing running from north to south with larger windows exposed towards the south and west, and that at the base of the L lie the bathroom and kitchen, the plumbing grouped economically in relation to services. Thus facades presented to north and east are window-less except for bathroom and kitchen, and out of this arrangement privacy is maintained for each house and for each patio. Between livingroom and patio big windows from ceiling to floor create an intimate relationship, though when the writer visited this development planting in the patios had scarcely begun, and it was therefore too early to predict how the relationship would mature. In contrast, kitchens and bathrooms are given a curious but not unpleasant form of screened exposure by means of barred windows, allowing a filtered light to enter the rooms in question while screening the occupant and the kitchen and bathroom gear from sight from outside. This useful device was found in the houses at Højbjerg, where the architect had frankly copied them from Kingohusene.

Unlike Grenhusene, garaging is brought to each house and not concentrated in compounds; this might be thought retrogressive, but it

meets a complaint which the Grenhus tenants voiced, and by making the garages accessible via irregularly shaped enclosures between the house-clusters, due deference is paid to the principle of concentration of which, after all, the compound is only the extreme example; again, divergent trends are brought together to a new level of advanced design.

The same is true of the combination of architectural influences present in the design of these enclosures and their pieces of connecting street. Restricted space and blank walls might well have involved bleakness and an unfriendly atmosphere. The atmosphere is not as friendly and welcoming as in conventional Danish villa developments, but it is much relieved by its curiously mediterranean quality, African rather than European perhaps.

Locally, the mediterranean qualities of the street scene are frankly identified as "Arab", but largely without the sting which this name was made to insert into popular opinion of the Weissenhof scheme for political reasons in Germany of 1927. There are complaints that in winter, with low northern angles of sunshine, the streets lined with blank brick walls are rather desolate. Similarly, in winter, the patios and the rooms surrounding them partake of the desolate quality of a snow covered landscape which under these conditions is more a patch of ground than a landscape. This may be a matter which maturing of the planting puts right.

Tenants visited felt that privacy had been underdone rather than overdone, particularly in the low height of the boundary wall of the patio

towards the south, although it was realised that this had been kept low in order to open a view across the centre of the development.

Of the houses themselves, tenants had little to criticise. One who knew the Grenhuse development said that he much preferred his own because his house had more of a villa-like quality in which the rooms were less huddled together and he preferred drawing all his daylight for the habitable rooms from his own open space to drawing any of it, by means of clerestorey windows and the like, from that of his neighbours. It is interesting that this was also the reaction of occupants to their patio-like house at Fulda in Germany.

The sample house studied in detail was found to be occupied by a young couple with two children who had furnished the house with a miscellany of new furniture and inherited older furniture, treating the problem of furnishing and of space use with a certain degree of abandon as regards the older Danish traditions. After inspecting the very neat houses, described in certain of the case studies above, it was refreshing to come across a house where there was little or no attempt at conventional neatness but considerable thought given to space use, not least concerning the children. The photographs reveal this atmosphere of informal utilitarian furniture arrangement. The livingroom itself, consisting of living space and dining space, is furnished so that there is a comfortable sitting arrangement, orientated to the view through big glass windows into the patio and beyond, while the dining arrangement consists of the neat table for four which standard Danish dimensions nowadays produce.

It was observed that this table fitted exactly into the space provided for it in the plan, not likely to have been an accident. It was similarly observed that beds and wardrobes fitted well into the bedrooms, doors and wall dimensions having been drawn in such a way that standard furniture is easy to place.

As regards the patio, this was found to be in the same state of mild disorder as the house. Children's toys were lying about, there was a small sand pit for them to play in and little attempt at formal gardening. The impression was not dissimilar from that of the patios at the Tuscolano housing in Rome, and this characteristic was observed also to apply to many of the other patios into which the writer looked though not inspecting the houses.

If on the whole tenants' reactions were laudatory, it is fair to put on record that for the most part they had taken up their occupancy by choice, preferring these unusual houses to more conventional types and therefore were already conditioned to the type of existence before they had taken up occupation. Thus, families were prepared to study, to understand, and make use of the living-room and patio relationship, to expect a balance of privacy and exposure in accordance with the way in which the patio is treated in this scheme, and not to look for space in which, either indoors or out of doors, the conventional suburban existence could be led.

A lingering impression remains of a design of considerable depth. Southern influence is deeper than the architectural details of the street

facades. Danish tradition is present in more than the dimensioning of rooms. Spaces indoors and out of doors contain delicacies of adjustment which are more than matters of habitual drawing-board exercise and also more than mere copying from places abroad.

Though it is early to make the comparison, with the one design still new and raw and the other only under construction, it seems that Kingohusene has much in common with Gela, the new Italian town project in Sicily described in Chapter 4. Comparison starts, of course, with the similarity of the L-shaped patio house in each case, but extends also to the street arrangements and other things.

Both seem to represent a fortunate combination of northern and southern influences, and the fact that they stand at the northern and southern limits of the present study gives this comparison added significance, each representing equally advanced thought about humane modern environment in all its complexities of inherited ideas and new functional requirements. What cannot be compared is the view from the houses. In the one case it is limited by the edges of northern Sjaelland's rolling wooded country-side. In the other it extends to the Mediterranean horizon, beyond which the imagination sees another continent. Of the two, the Italian designer has the easier task.

(12) THE "KOLLEKTIV" HOUSES AT AARHUS AND SILKEBORG

The trend in Danish housing to associate communal facilities with major developments, particularly those containing tall buildings,

has already been noted. This trend is common to the Scandinavian countries and can be traced to 1935 when Sven Markelius built his pioneer Kollektivhus at John Ericssons Gata in Stockholm. His building was intended for families where both parents went out to work, and contained besides flats of various sizes from one to four rooms, a small restaurant and kitchen, a child's crêche and a communal laundry, besides a flat for a manageress, with rooms for a nurse, chambermaids and a porter. Food could be had direct from the kitchen to the flats by means of a lift. The Markelius building is only on six floors, with ten flats per floor, and one of its first results was to prove that, even when the restaurant was open to the public, more dwellings needed to be served if the communal facilities were to work properly.

The "Kollektivhus" at Aarhus dates from 1958 and consists of twin 15-storey towers, each containing 120 small flats. 28 are single-room flats and the remainder two-room flats, arranged on 14 floors, the ground floor being devoted to communal facilities. These are still in general those selected for the Stockholm pioneer example. But they are on an elaborate scale. There is a restaurant capable of seating 100 served by a fully equipped kitchen, a coffee bar, and adjacent, also served by the kitchen, a 'Selskabslokale' (lit. company-place), a room for such things as birthday and wedding parties and able to seat 50 guests. It can be extended by means of a sliding partition to take in whatever may be needed of the adjacent room which normally functions as a commonroom, fitted out with armchairs, tables, standard-lamps, and equipped with its

own small cloakroom.

To contain all this, the ground floor extends in the form of a little courtyard development byond the confines of the towers. This helps to provide room for such extra facilities as a small general shop, five bedrooms for staff served by a tea kitchen with appropriate lavatories and bathrooms, and six guest bedrooms simila rly served. In a separate block is a communal laundry, a darkroom for photographic work and a hobby-room fitted with workshop benches.

A sample two-room flat was visited, consisting of living-room and bedroom with a small kitchen and a minimum sized bathroom containing a W.C. and washbasin. Over the basin was a shower nozzle with a drainage outlet in the floor, enabling the whole thing to be used as a shower compartment. Between the bedroom and the living-room was a stack of cupboards forming the only storage provided. The young couple were occupying this flat only temporarily, they said. It was exactly the sort of thing in which to start married life but as soon as possessions accumulated it would be necessary to move out. On the writer's arrival, the husband, a schoolmaster, was actually engaged in drawing out plans for a villa which he hoped to build in the near future. When he was asked whether this would not be sacrificing the availability of such generous communal facilities as his present establishment provided, he replied that he and his wife hardly ever used these, preferring to make their own meals in their own little kitchen. Their furnishing was comparatively uninteresting and was not recorded in detail. It consisted of a mixture

of inherited pieces and individual well chosen examples of modern chairs, cupboard fitments, bookshelves and the like, with some improvised use of packing-cases disguised by cloth coverings.

Enquiries about the use of the communal facilities suggested that it had been difficult to persuade tenants to make full use of the restaurant, but, after a year or so of occupation, about 90% of the tenants were found to be using it regularly, by which was meant taking at least four main meals there per week. Of the 10% who did not use the restaurant at all (evidently including the couple whose flat was visited) it was confirmed that these were young people, and that from the start the older people had made most ready use, not only of the restaurant and also of the commonroom, which on the writer's visit was found deserted. On the other hand, the young housewives made full use of the laundry and the young husbands were using the hobby-room well, chiefly for the purpose of making things for their flats or for flats or other dwellings into which they hoped to move. There was a fairly continuous movement of tenants out of the building into larger dwellings and according to the rules this had to happen whenever children arrived. Tenants of the single-room flats included a number of students who had not obtained accommodation in student hostels and there were also some batchelor men and women who, it was thought, might form a nucleus of a more or less permanent community.

In the similar but smaller "Kollektivhus" at Silkeborg, consisting only of one tower block containing 84 flats, it had been more difficult to get people to use the restaurant and tenants had had to be told that if they

did not make use of it the rent would be raised. The reason given for this reluctance was that in the case of Silkeborg the tenants were chiefly country people migrating to urban employment, but bringing with them the frugal habits of the villages. It was generally thought both at Aarhus and Silkeborg that the solution to the problem of full use of the communal facilities lay in enlarging the community for which they were available. At Aarhus this use had been extended to inhabitants of housing blocks within a range of about half a mile and this was helping to bring together a fuller kind of community. The same experience was reported in Copenhagen where the famous and successful example of this kind of institution, architecturally less interesting than the Jutland examples, was visited: Carlsro at Rödovre. It is a large development of single-storey buildings not unlike Söndergaardsparken, the inhabitants of which share facilities with those of a four-storey walk-up block of single- and two-room flats. From a town planning point of view, this Copenhagen example is better sited than those at Aarhus and Silkeborg, being at the town centre of Rödovre, close to Professor Arne Jacobsen's well known town hall, and this may account for a use of the facilities provided distinct from the writer's experience of the Jutland examples. Professor Faber describes it in glowing terms. "The sense of community is real and of great importance; young and old gather for communally arranged entertainment on a generous scale in big public rooms and halls."[17]

At Aarhus and at Silkeborg, the floor areas for single-room flats measure about 360 sq. ft. and for 2-room flats just over 500. This places them well down towards the minimum size of dwelling encountered

in the course of the present study.

It is, of course, unfair to judge such space provision without taking account of the share of communal space on the ground floor which each tenant, theoretically at least, enjoys. Adding together the floor areas of the communal rooms, but omitting such things as cloakrooms, kitchens, the shop and the administrative offices, each flat theoretically is increased in size by about 25%. This does not quite amount to an extra room, and it can therefore be argued that the provision of this space in communal form is an economy, since its effect, if fully used by all tenants, would be to add a diningroom, even an extra livingroom, to each flat. All this is somewhat theoretical since in practice the catchment area of people served by or capable of being served by these institutions remains flexible, and even at Carlsro there is no sign yet of the emergence of standards based on survey arithmetic.

The spirit of these collective buildings is decidedly one of cooperative management. This means that, with the exception of the shops in certain cases being let out to concessionaires, the restaurants and laundries are run by salaried staffs on a non-profit-making basis. That is not done without difficulties and the view was expressed to the writer that restaurants in particular would be easier to operate, and possibly also provide more attractive food, if they were likewise the subject of competitive letting to local restaurant undertakings on a purely commercial basis.

It was reported by the architects, Messrs. J. K. Schmidt, of Aarhus, that the construction of the tower blocks had been relatively cheap, giving these buildings a satisfactory launch as regards capital outlay and rents. Figures were not investigated. It was further explained that the system-building used had worked well and was being applied by the same architects elsewhere to bigger schemes still at the drawingboard stage.

SUMMARY OF CONCLUSIONS FROM CASE STUDIES

(1) In Denmark, despite appearances, the design of flats has always tended to be conservative and conventional. If this is to change, a dramatic departure from convention is needed, perhaps in the direction of tower blocks with steppings and projections creating varieties of dwelling shapes within the same building. Arkitekt Dybbro's ideas could be taken up.

(2) The villa is the most consistently successful house-type, proving adaptable to cheap construction and by careful site planning capable of sufficiently dense development to survive into a period of tougher density requirements.

(3) The patio-house promises to fill an economic gap between villa and flat and to commend itself in its own right as good to live in, especially in the town planning context of traffic segregation and in featureless topography. It is for consideration whether the patio-house should not be associated with tall buildings to give topographical direction, as at Leith Fort in Scotland, rather than associated only with low-rise flats, as at Albertslund.

(4) Space standards in Denmark, indoor and outdoor, will lose character if they get too ambitious. The Danish ethos of design is the success of the unpretentious.

(5) The nation-wide acceptance of communal hot water supply is a challenge to the other countries. It should be closely watched and also made the subject of at least one major experiment in a neighbouring

northern country, such as Scotland.

(6) Landscape design is the most advanced of all such design seen in the five countries, but it must keep its control of space, especially the exploitation of restricted space.

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3. Soya: Farmor pp. 27 - 43 : the English translation by Agnes Camilla Hansen is checked with the original, removing inaccuracies of terms.

4. Ibid. pp. 192, 193.

5. Tobias Faber: Dansk Arkitektur, P. 119.

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